THE IRON AGE

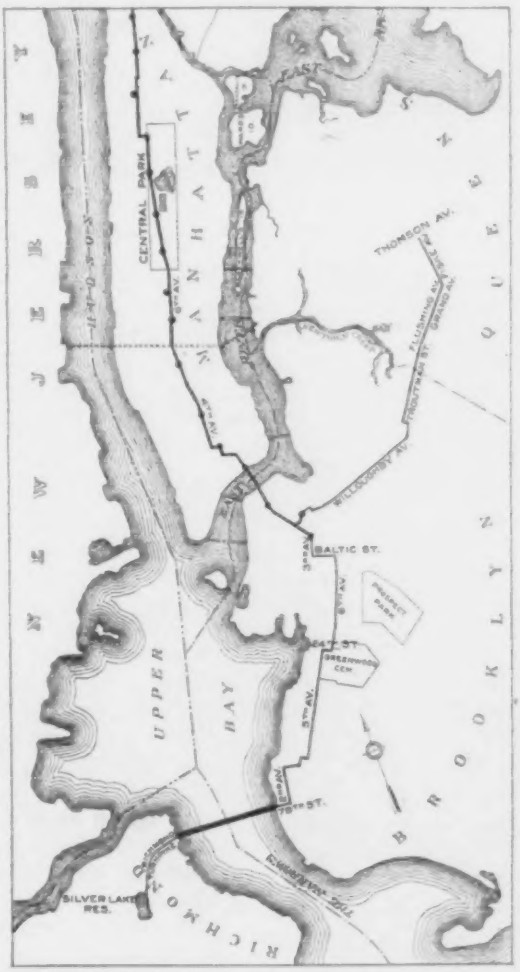
Established 1855 New York, August 13, 1914 *Vol. 94: No. 7*

Narrows Siphon of the Catskill Aqueduct

Machining and Testing the Special Flexible Joint Used to Permit Launching of the Pipe from a Lighter in New York Harbor

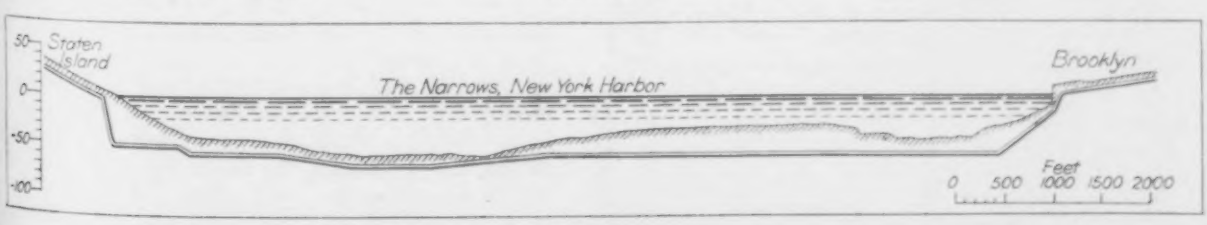
To enable the Borough of Richmond, New York City, as Staten Island is officially known, to receive 15,000,000 gal. of water every day from the Catskill Aqueduct, a flexible jointed cast-iron line, about 10,000 ft. long, will be laid under the Narrows of New York Harbor. This pipe will be laid in a maximum depth of water of 60 ft. and subjected to a current of more than 3 miles per hour, with periods of quiet between the tides. The location of this pipe line with reference to the other portions of the aqueduct in New York City is indicated on the accompanying map, while a profile of the line is shown in the drawing underneath. There is a considerable portion of this work that will have to be done in the main ship channel of the New York Harbor, and a trench of considerable depth will have to be dug to comply with the requirements of the War Department. The dredging of this trench will be a more or less difficult job, as the specifications provide that not more than 1000 ft. of the channel can be obstructed at any one time. After the pipe has been successfully placed in this trench a covering of approximately 8 ft. of silt will be placed over it to guard against damage from the anchors of vessels.

As was announced in *The Iron Age*, April 9, 1914, the contract for the manufacture of the pipe for this section of the aqueduct was awarded to the Westinghouse Machine Company, East Pittsburgh, Pa. The pipe is 36 in. in diameter and is made with a special type of flexible joint to permit it to be lowered down an inclined plane from a lighter within a steel lattice work, known as a launching frame. After the pipe has reached the bottom of the harbor it must accommodate itself to some extent to the inequalities present in the bottom of the trench. The special features of the joint are the flexible bell turned on the interior, reinforced by a band of steel shrunk on, and a spigot having deep grooves for the retention of the lead and a narrow turned collar to bear on the bell and insure a uniform leaded space to carry the weight. The average laying length is 12 ft. and the approximate weight of each length is 10,000 lb.

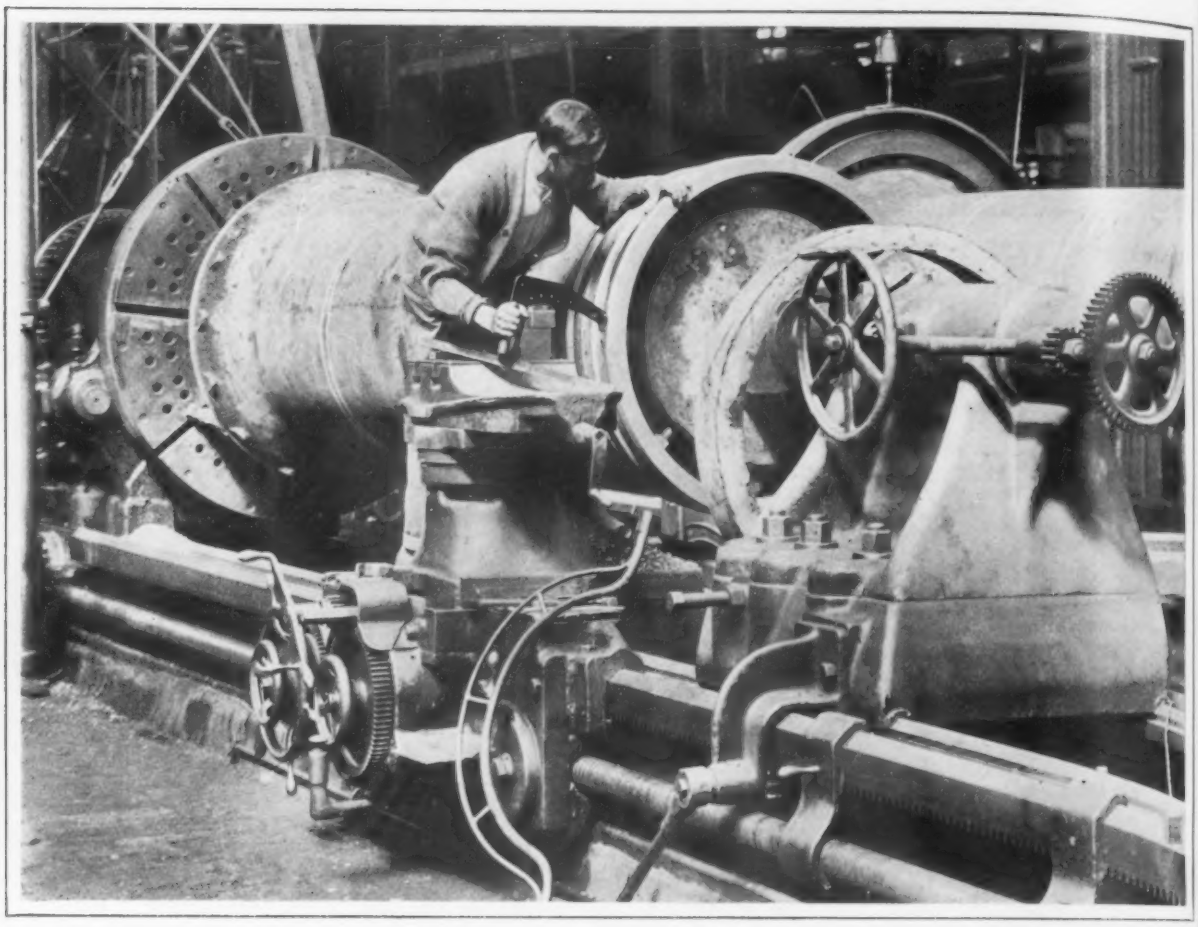


Plan Showing Location of the Siphon Under the Narrows

In addition to describing the average laying length of the pipe the specifications provide that the thickness of the metal will not be less than 0.1 in. less than the standard thickness, except for spaces not exceeding 8 in. in length in any direction, and variations from the standard thickness of 0.03 in. in excess of the allowance given above will be permitted. No diameter of any pipe at any place in its length shall be greater or



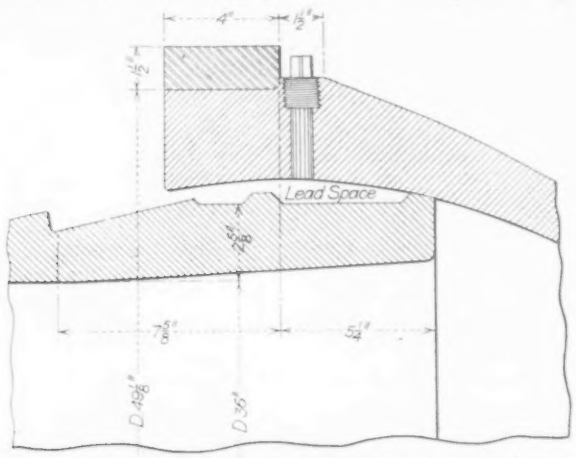
Profile of the Siphon



Machining the Ends of the Pipe

less than the standard diameter by more than 3/16 in. The pipe is to be coated inside and outside with a bitumastic solution or bitumastic enamel, and before the first coat has been applied the pipe shall be subjected to hydrostatic pressure of 350 lb. per square inch and to a hammer test under this pressure. The angle of maximum deflection of the joint is to be 10 deg. in 50 ft. The weight of the pipe will be approximately 4100 tons, including some 300 tons of hub and spigot pipe. The pipe was cast at the Trafford City foundry of the Westinghouse Company and the machine work on the joint, which is described in this article, was performed at the East Pittsburgh plant.

The specifications covering the machining of the joint provide that the inner surface of the bell of the spigot collar, which is to come in contact with the bell shall be turned to a truly spherical surface and no pipe will be accepted which differs in these parts by more than 0.01 in. from a true sphere. It is further provided that there shall be no depressions in the machined inner surfaces of the bells and they shall be free from chatter marks and tool cuts and that the finished pipe shall be interchangeable. The first of the machining operations is preparing the spigot and bell ends for the steel band. In this operation a mandrel is placed in the pipe, which is centered by screws in the flanges of the mandrel. The pipe is then mounted in a lathe and a 6-in. sink head at the spigot end of the pipe is removed with a parting tool. The end of the pipe is then made to conform to the special gauges and the bell end is turned to exact dimensions to admit the steel band which must be shrunk on before the bell is bored. The spherical boring of the bell end is accomplished with a lathe which is equipped with a special revolving table, A, having its supporting bracket B attached to the tailstock. Three tools of 1¼-in. high speed steel are clamped upon this table and are arranged so that the first and second take the roughing cuts, while the third does the finishing. The table revolves continuously during the taking of these cuts, and as one tool finishes its cut at the inner side of the pipe, the next is within 1 in. of starting in, so that the operator has just sufficient time to change the feed by a pull pin in the center of the shaft C in the feed gear train. When the finishing cut has been taken, the spherical surface is ground smooth by a grinding wheel which is fixed to the armature shaft of a 3-hp. motor mounted on the revolving table. In fitting up the lathe for this work, it was necessary to provide means for revolving the table by power and also obtain a continuous feed for each tool. This result is accomplished by taking the change gear train at the headstock as a base to operate the shaft

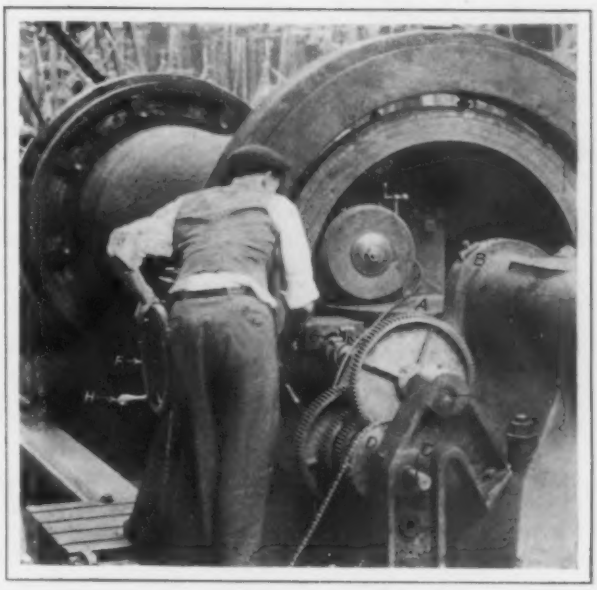


Cross-Section of the Flange Showing the Construction of the Flexible Joint

that ordinarily actuates the lathe carriage. A sprocket wheel having a feathered key is mounted on this shaft and is guided by brackets which are not shown. The sprocket chain passes over a set of idlers to the feed changing gears at D and the power is then transmitted through the shaft E to bevel gears on the worm shaft F which actuates the table wormwheel. A clutch at G, when disengaged, permits the table to be revolved by the handwheel H.

After the lathe work has been completed the pipes are brought to a radial drilling machine and mounted on four rollers to enable the drill operator to index the 16 holes to be drilled, reamed and tapped at the bell end of the pipe quickly.

As has been already mentioned, the joint is of the spherical variety and acts somewhat similar to a hip joint. Lead is poured into the flange and when it cools keeps the joint relatively tight and permits motion. This method of lead calking is, however, open to the objection that while the lead is adapted to the purpose, it nevertheless contracts somewhat as it cools. In more or less still streams it would be possible for a diver to descend and calk the joints, but this would not be practical in New York Harbor on account of the swift current which would prevent work from being prosecuted more than for 1 hr. per day. The joint used was developed as the result of the suggestion of a workman who stated that he had seen shot forced into small lead filled joints. Lead in small rods is introduced through the holes in the bell end of the pipe and is forced down into the joint by a powerful screw plunger to unite with that which is already in the joint. The construction of this joint is illustrated in one of the accompanying drawings.



Performing the Spherical Boring of the Bell End in a Specially Equipped Lathe

After all machine operations have been made the pipes are placed on electric trucks and taken to the testing plant, which is located in the shop yard. The top part of the truck is of such a hight that the pipe may be rolled from it directly on the tracks leading to the hydraulic testing machine. As the pipe approaches the machine it enters between guides which are fastened to the end plates C and E, at the outer end of which is a hole to receive stop pins. As the pipe is rolled between the plates it stops against the pins which are located in the proper position for the end plate E to be brought against the end of the pipe. The end plates are counterbored to receive rubber gaskets ½ in. thick. The counterbores are such that the gaskets are squeezed 1/16 in. when pipes and plates are brought together and the gaskets are made smaller than the inside diameter of the pipe to allow the rubber in excess of what is required to fill the counterbores in the end plates to flow within the inner edge of the pipe when the plates are brought against the ends of the pipe. The application of water pressure forces the excess of rubber within the pipe into the counterbore, this arrangement being relied upon to give a perfectly watertight joint.

The Plant Used in Making the Hydraulic Test of the Joints

To meet the specification requirements calling for a hydraulic test of 350 lb. per square inch after the pipe had been machined, a hydraulic testing plant has been provided. There is a large tank, A, which contains about 6000 gal. of water to be used in filling the pipe to be tested quickly. The admission of the water is controlled by the valve B, which when opened permits the water to pass

through the stationary end plate C into the pipe to be tested, the valve D being provided to permit air to escape from the top of the pipe during the filling process. The plate E is located opposite the end plate C and can be moved toward or away from the pipe to be tested by two 10-in. hydraulic jacks and counterweights. The force of the jacks F is resisted by two cast-iron backs G and H, which are bound together by two hammered steel rods I, $5\frac{1}{2}$ in. in diameter. The jacks have a movement of about $1\frac{1}{2}$ in. and are required to exert a pressure of about 125 tons each, which is sufficient to just resist the water pressure in the pipe. A four-plunger pump, J, is used to operate the jacks, while a single-plunger pump, K, is used to bring the pressure of the water in the pipe to the required figure.

After the pipe has been properly located, the pump J is started until the end plates C and E have been placed in position. The valve B is then opened until water comes through the air valve D which is then shut off. The pump K is started and operated until the desired pressure of 350 lb. per square inch is indicated on the gauge, the check valve Q preventing the water from being forced back into the tank A. After the test has been completed the pumps J and K are stopped and the water from the pipe allowed to flow into the cistern M. From here it is returned by a three-plunger pump, L, which pumps the water back through the pipe N to the tank A. The stop pins are then withdrawn and the pipe is rolled along the track to be shipped.

In laying the pipe it will slide down an inclined steel lattice work known as a launching frame from the lighter. On account of the current the lighter from which the pipe is lowered must be kept absolutely steady. For this purpose 10 anchors will be required, each of which will have from 1000 to 1200 ft. of $1\frac{3}{8}$-in. steel cable.

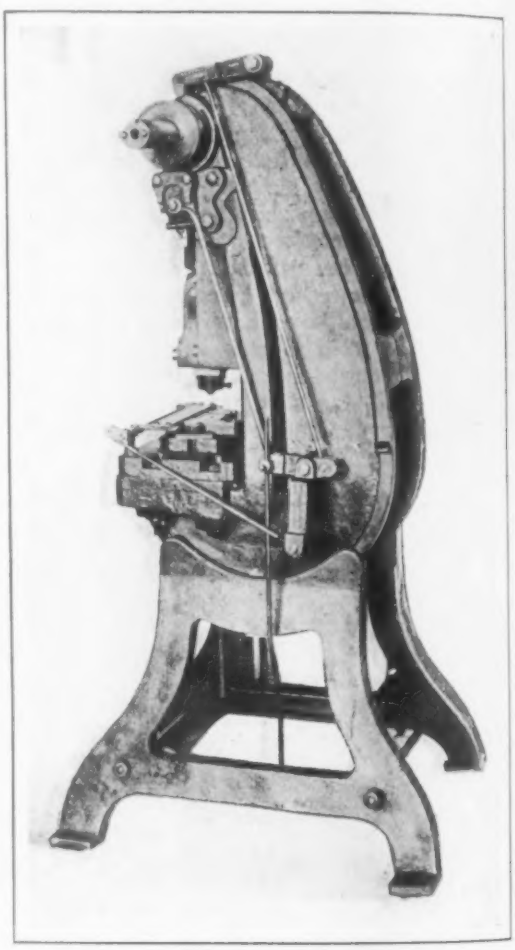
An Improved Punch Press Safety Device

The H. & A. Lock Company, 156-170 Fifty-third street, Brooklyn, N. Y., has brought out a new type of its duplex punch press safety device, which is called the duplex superior. It is a simplified combination of the simplex and duplex attachments. The simplex device operates the guard plate by means of rods connecting it with the foot treadle through a bell-crank attached to the side of the press. The superior duplex type combines this device with another by connecting the back of the bell-crank with the middle of the lever, shown in the illustration, which is pivoted to the top of the press frame and is provided with a roller which runs on the crank shaft sleeve. The press is started or stopped by the foot treadle which operates the guard through the simplex device. Once in motion it is raised and lowered automatically by means of the cam on the crank shaft sleeve.

The simplex device raises the guard to a vertical position and forces the hand of the operator away from the danger zone before the press is tripped. It requires no effort to operate the guard. The weight of the operator's hand resting upon the guard plate automatically locks the press. In case the press gets out of order through the friction collar becoming loose or splashed with oil, the clutch breaking or the flywheel catching on the crank shaft through lack of lubrication, the duplex attachment operates the guard automatically so long as the press is in operation.

When the crank shaft passes the center on the downward stroke, the roller on the lever arm of the duplex device engages the cam on the crank shaft collar and abruptly raises the guard plate to a vertical position, carrying the operator's hand away from danger and remaining there completely blocking it off from the punch and die until the downward stroke is completed. When the upstroke begins, the roller drops down from the cam to the crank shaft collar and the guard plate is dropped flat with the die. This cycle repeats with every revolution of the crank shaft.

Advantages are claimed for this type of safety guard over the screen or box type which drop down from above, in that it cannot in any way injure the operator's hand. It is adjustable to any size or type of punch press. No extra springs are required to operate it and no set screw adjustments are necessary. It is claimed to be fool-proof in that it forms an infallible link between the operator's foot and hands.

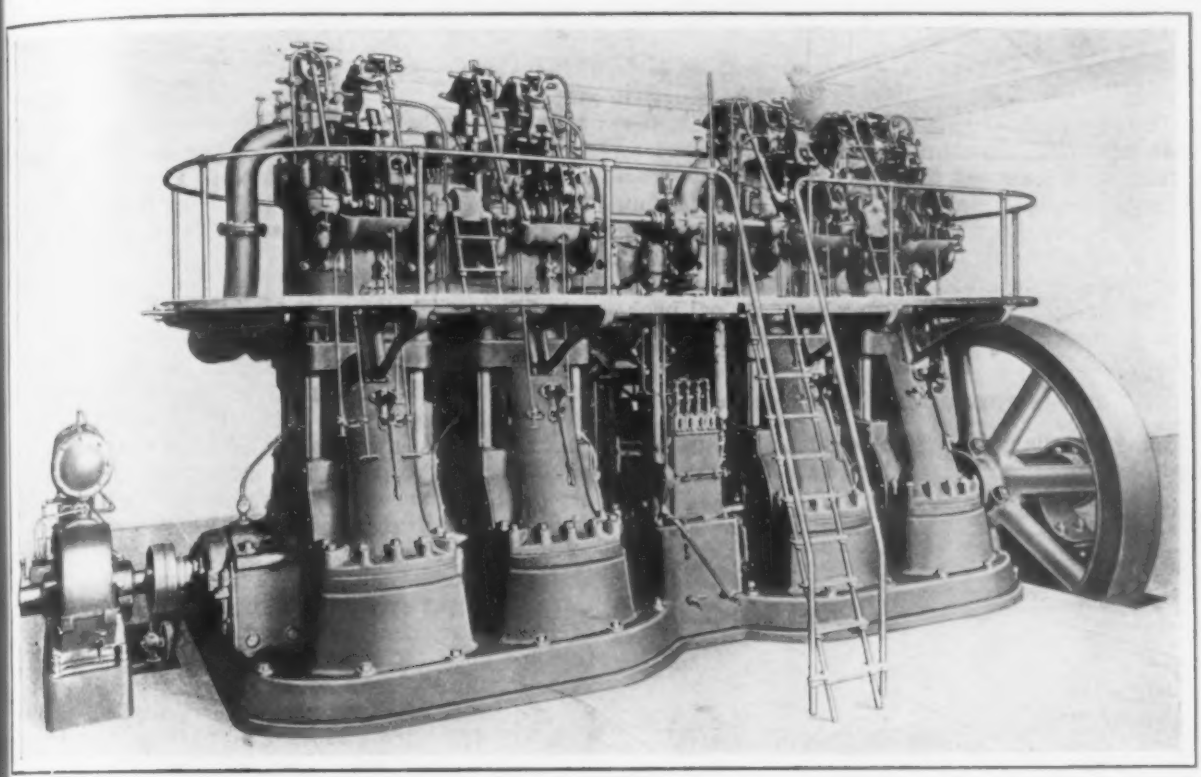


A New Type of Punch Press Safety Guard Operated Both by Foot Treadle and by Cam on Crank Shaft Sleeve, Shown with Flywheel Removed

Walter Wood, Philadelphia, has sent notice to the trade that the partnership between Walter Wood and Stuart Wood, trading as R. D. Wood & Co., terminated by reason of the death of Stuart Wood on March 2, 1914, is now being liquidated by the surviving partner. The business so long carried on at 400 Chestnut street, Philadelphia, will hereafter be conducted by Walter Wood, and as heretofore under the name of R. D. Wood & Co. This firm name and the business for which it stands represent a history of 110 years and the house has been one of the most important factors in the East in the manufacture of cast-iron pipe, gas producers, hydraulic machinery, and a number of other lines of heavy foundry work.

The Largest American Diesel Engine

One of the largest Diesel engines constructed to date in this country, if not the largest, has been completed by the Lyons Atlas Company, Indianapolis, Ind. It is of the vertical four-cycle type with four cylinders having a bore of 21 in. and a stroke of 30 in. The engine, which is rated at 600 b. hp. with an overload capacity of 15 per cent., was sold to the Hawaiian Commercial & Sugar Company through its New York agents, Alexander & Baldwin, Ltd., and is intended to supersede a steam irrigation plant, being directly connected to a two-stage turbine pump, having a capacity of 16,000,000 gal. with a head of 200 ft. The engine will use the only grade of liquid fuel available in the Islands, which corresponds to the ordinary 14 to 18 deg. asphaltum base California fuel oil.



A Four-Cylinder 600-hp. Diesel Engine Which Is Said to Be One of the Largest Constructed in the United States Thus Far

The specifications for the engine provided that it should operate continuously 710 hr. out of a total of 720 hr. per month at the rated load, using the liquid fuel that was employed in the company's steam plant. The acceptance test of the engine was conducted by the chief engineer of the Hawaiian Commercial & Sugar Company at the builder's plant. A preliminary continuous run of 48 hr. with a paraffine base Eastern fuel oil was made, and at the expiration of this period all the parts connected with the combustion chamber were inspected to determine a basis for comparison between the effect of the two fuels. Following this a continuous run of 144 hr. at full load was made with fuel shipped from California. The combustion chambers were again examined at the completion of this run, and as there was no evidence of carbon deposit on the heads, valves or pistons, the engine was accepted. It is now on its way to the Hawaiian Islands, where it will be erected by the purchaser's engineers without any assistance from the manufacturer.

Officers of the Panama Pacific Exposition say that the European war will have no effect on the exposition so far as its opening date is concerned.

Supplymen's View of Rate Decision

President George A. Post of the Railway Business Association, which is composed of a very large number of manufacturers of railroad supplies and materials, taking in all sections of the United States, is quoted as follows in the Boston News Bureau:

"Disappointment over the denial of rate advances to Eastern trunk lines, in face of the finding that they need more income, is somewhat softened by the temperate tone of the decision and by several important steps forward in the commission's attitude toward carriers.

"Railroad managers are acknowledged to have shown sound judgment when they gave warning in 1908-1910 of an impending decline in net income. Railroad income in official classification territory is definitely pronounced too low. Jurisdiction and obligation to consider railroad earnings, income and credit in regulating rates are explicitly assumed. Three years ago solicitude for the financial health of the roads was expressed, but failed of its effect in strengthening credit because not accompanied by action. Roads of a region are granted advances notwithstanding that some of them have been criticised for their conduct. Increase of passenger rates, very difficult to effect in the past, obtains federal approval. Necessity for proceeding to the immediate solution of income problems, without waiting for collateral inquiries, is recognized. Definite standards are set up by which carriers may hereafter gauge their financial condition and determine whether the showing will be regarded as requiring remedies.

"Any one who has followed the rate advance litigation from the pioneering in the 1910 case will agree that development of a definite standard is a long stride forward and will save the roads large sums in preparation of regional rate cases, as well as substantially increase their chance of winning awards."

The great Chicago, Milwaukee & St. Paul Railroad tunnel through the Cascade Mountains, in the State of Washington, which is 12,000 ft. long and will reduce the altitude of the crossing 443 ft., was broken through by a blast August 4, and men from east and west clasped hands through the gap. The tunnel will save four miles in distance and will avoid the enormous snowfall of the summit.

The Strength of Non-Ferrous Castings*

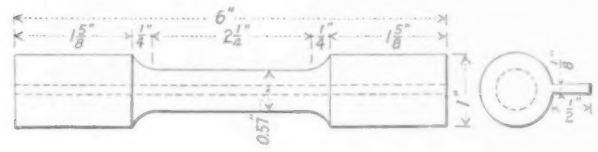
How It Varies in Different Parts in Copper-Tin and Copper-Zinc Alloys—A Comparison of Different Test Bars

BY L. P. WEBBERT†

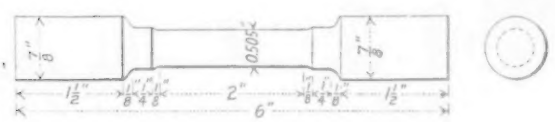
The object of the investigations described in this paper is to note the changes in strength that occur in different thicknesses of metal castings made from the non-ferrous metals met with in engineering practice. The knowledge desired, from the machine-designer's point of view, is to know how to proportion the separate parts of a design with regard to strength, and to know what physical properties to expect from a casting at different points or as a whole.

DESCRIPTION OF TEST SPECIMENS

Some metallurgists strive to adopt a test specimen to represent the strength of an alloy which will



(*a*) As Cast.



(*b*) Finished.

Fig. 1—Test Specimens for 88-10-2 Castings

give the maximum results obtainable for that metal. Such test specimens give results that are interesting but tend to mislead. Quite a number of different types have been suggested for adoption as a standard, but when we consider the specifications that must be followed in practice our choice becomes decidedly restricted to a few forms.

There are two styles of test specimens made use of in practice, one for the copper-tin alloys and the other for the copper-zinc alloys. The first is that used on 88-10-2 castings (copper 88 per cent., tin 10 per cent., zinc 2 per cent.). This test specimen, as cast with the casting, has the dimensions shown in Fig. 1 (*a*). A ⅛-in. gate running the entire length of the test specimen connects it with the casting. Being gated in this manner allows the test specimen to be filled quickly with metal and has the advantage of giving the same rate of cooling to every part of the specimen. When the test specimen is detached it is turned down in a lathe to the proper diameter and form as shown in Fig. 1 (*b*). In Fig. 3 (*c*) are shown the forms placed in the parting of the mold; two forms to give test specimens 0.505 in. in diameter, and one to give a test specimen 0.798 in. in diameter. When a test specimen is to be placed at another part of the casting, cores are made use of as shown in Fig. 4 (*b*) and (*c*).

For the copper-zinc alloys (manganese-bronze and brass) a bar of metal 1 x 1¼ x 6 in. is cast on the side of the casting. Fig. 3 (*b*) shows two patterns for this style of test specimen, the diameter of which is to be 0.505 in. These patterns are placed against flat surfaces. For curved surfaces different patterns are made to fit the curvature of the castings. The round part of the pattern shown in Fig. 3 (*b*) allows the pattern to be drawn easily from the sand.

SKIN OF CASTINGS HAS GREATEST STRENGTH

It is well known that to obtain the highest results from 88-10-2 test specimens the least amount of metal should be turned off the specimen. In comparing Fig. 1 (*a*) with (*b*) it will be noted that 0.065 in. of metal is turned from the test specimen. In the "skin" of the casting lies the greatest strength, as the foundryman puts it. To illustrate: A large valve body, ¾ in. in thickness, made from 88-10-2 metal, was cut up to procure test specimens from the flange and body of the casting, in order to compare the strength of these with the strength of the test specimen attached to the casting. The test specimen (0.505 in. in diameter) gave an ultimate tensile strength of 40,000 lb. per sq. in. and an elongation in 2 in. of 40 per cent. From the body the following results were obtained:

	Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent.
1	25,800	13.0
2	25,200	11.0

From the flange the following results were obtained:

	Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent.
1	23,650	11.0
2	18,850	5.0

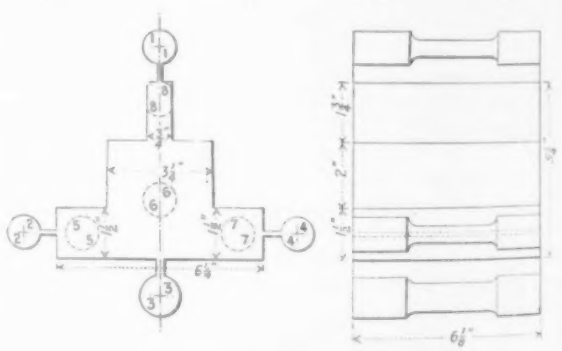


Fig. 2—Test Block Showing Dimensions and Numbering of Test Specimens

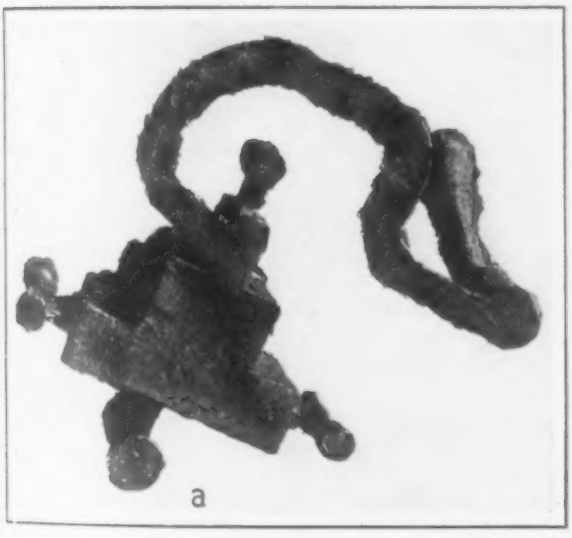
When the test specimen was turned down to the proper diameter, very little of the skin was turned off. The test pieces from the interior of the metal possessed no skin and gave lower results. The results emphasize the fact that the test specimen attached to the casting exaggerates the strength of the casting as a whole.

If the diameter of this style of test specimen is increased lower results are obtained. Let us compare the 0.505-in.-diameter test specimen (0.2 sq. in. in area) with the 0.798-in.-diameter specimen (0.5 sq. in. in area). The ratio of the area of the 0.505-in. test specimen to the circumference is smaller (area ÷ circumference = 1.26) than the ratio of the area of the 0.798-in. test specimen to its cir-

*Part of a paper presented at the seventeenth annual meeting of the American Society for Testing Materials, at Atlantic City, June 30 to July 3, 1914.

†Chemical Engineer, Bath Iron Works, Bath, Me.

cumference (area ÷ circumference = 1.99). In the former case we state that there is more skin, so to speak, to the specimen and consequently more strength obtainable than with the larger-diameter specimen. The author has averaged 61 tests from large castings having the 0.505-in. test specimen and gives the following average: Tensile strength, 46,580 lb. per sq. in.; elongation in 2 in., 38.7 per cent. Among these tests a maximum tensile strength of 51,650 lb. per sq. in. is noted, with an elongation of 62.5 per cent., which is also the maximum elongation. The minimum tensile strength among the tests is 39,100 lb. per sq. in. with an elongation of 25 per cent. The minimum elongation is 20 per cent. The specifications under which these castings were made required a minimum tensile strength of 30,000 lb. per sq. in. and a minimum elongation of 20 per cent. in 2 in. A specification from another source called for a minimum tensile strength of 35,000 lb. per sq. in., and a minimum elongation of 20 per cent. in 2 in. for a test specimen of 0.5 sq. in. area (0.798 in. in diameter). This style of test specimen was placed on 10 large 88-10-2 worm wheels. The tests gave an average tensile strength of 36,324 lb. per sq. in., and an average elongation of 27.1 per cent. The maximum tensile strength among the tests was 42,800 lb. per sq. in., with an elongation of 36 per cent., which was also the maximum elongation. The minimum tensile strength was 29,300 lb. per sq. in., with an elongation of 17 per cent., which was the minimum elongation. Among these 10 wheels there were two—one



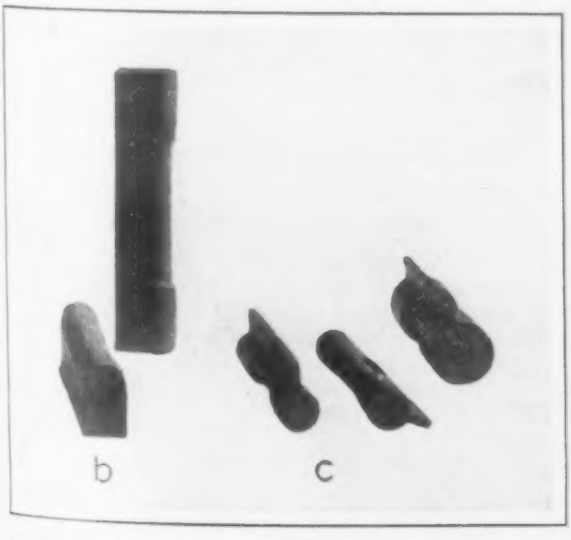
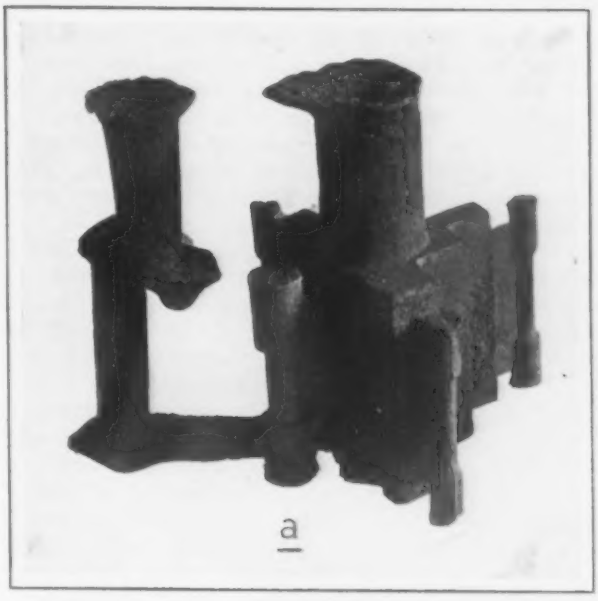


Fig. 3—(a) Manganese-bronze Test Block, (b) Manganese-bronze Test Specimens, (c) Test Specimens for Copper-Tin Alloys



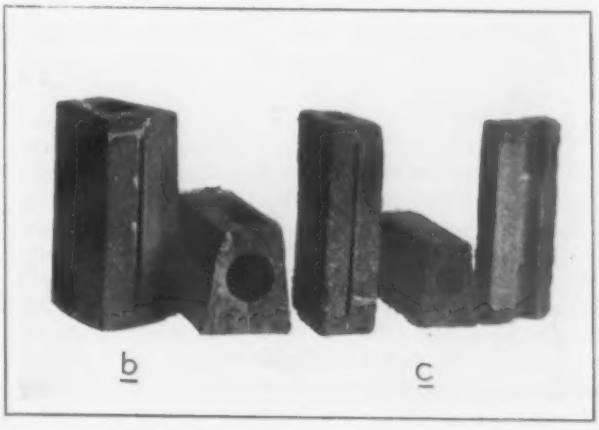


Fig. 4—(a) 88-10-2 Test Block. (b) and (c) Cores Used for Specimens 1, 2, 3, and 4 of Fig. 2

with a test specimen that pulled 32,500 lb. per sq. in. with an elongation of 21 per cent., and another with a tensile strength of 29,300 lb. per sq. in., and an elongation of 17 per cent.—that did not pass specifications. No doubt exists that had the 0.505-in.-diameter test specimen been used all tests would have given higher results.

We can conclude, therefore, that for this style of specimen used on copper-tin alloys, the smaller ratio of area to circumference of test specimen gives the greater strength. This is due to the fact that in general the rate of freezing of the metal is an important factor in influencing the strength of the casting. The skin of the casting receives the chill of the mold, is the first to freeze, and shows the smallest structure or grain. From the skin, freezing of the metal takes place gradually toward the center of the casting. The rate of freezing depends upon the following factors: (1) The thickness of the casting; (2) the temperature of the metal entering the mold; and (3) the conductivity of the mold.

VARIATION OF STRENGTH IN PARTS OF CASTINGS

In order to study the effect of the rate of freezing upon the strength of the metal, castings of copper-tin and copper-zinc alloys were made as shown in Figs. 2, 3 (*a*) and 4 (*a*). Fig. 4 (*a*) shows a block made of 88-10-2 metal with the test specimens attached which are used for this metal. Fig. 2 is inserted to show the arrangement of specimens and numbering on blocks made of copper-tin and copper-zinc alloys. Test specimens Nos. 1, 2 and 4 are of the pattern shown in Fig. 1. No. 3

is a similar test specimen to be turned down to a diameter of 0.798 in. Nos. 5, 7 and 8 are test specimens used on castings made of copper-zinc alloys (manganese-bronze and brass). A bar of metal is cut out of the center of the casting and turned down into a test specimen to represent the strength of the metal at the center. The relative advantages of these types of test specimens can be studied, since they are cast together on the same casting, are made from the same metal, and receive the same heat treatment. The specimens on all blocks made were numbered as shown in Fig. 2. Tables 1 and 2 give the results of all tests. The test specimens were not threaded but were pulled with grip jaws in the testing machine. In turning down the test specimens, Nos. 5, 6 and 7, were given a diameter of 0.798 in. The diameter was later changed to 0.505 in. in order to obtain uniformity in the size of the test specimens. Test specimen No. 3 was given a diameter of 0.798 in. for all blocks. In some instances this specimen was turned down to a smaller diameter when found slightly defective.

A few changes had to be made when casting the manganese-bronze blocks, on account of the nature of the metal. The risers were made larger, the sprues longer and the gates connecting test specimens Nos. 1, 2, 3 and 4 were made thicker. On the brass blocks the sprues were made similar to those of the manganese-bronze blocks; otherwise they were similar to those of the copper-tin alloys. After casting, the metal was churned in the riser in every case. Specimens Nos. 1, 2 and 4 were attached with the intention of observing how closely they would check each other when tested, thereby testing the reliability of this type of test specimen when made of the different metals. It may be mentioned that this type can not be depended upon when attached to brass castings.

Table 1—Analyses of Alloys

Alloy No.	Copper, per cent.	Tin, per cent.	Zinc, per cent.	Lead, per cent.	Iron, per cent.	Manganese, per cent.	Aluminum, per cent.	Phosphorus, per cent.
1	88.31	8.49	3.20	....	....	....	....	trace
2	87.98	10.64	1.28	0.10	....	....	....	trace
3	86.78	6.31	5.96	0.92	0.03	....	....	trace
4	84.28	11.31	4.15	0.06	0.06	....	....	trace
5	62.81	0.79	26.18	0.09	0.05	0.02	0.06	.....
6[a]	62.81	0.79	26.18	0.09	0.05	0.02	0.06	.....
7	84.49	.....	15.49	....	0.02	....	....	.....
8[b]	.....	.....	.....	....	....	....	....	.....
9	57.66	0.84	39.85	....	0.69	0.16	0.58	.....
10	89.08	7.48	3.00	0.07	....	....	....	0.20

[a]Alloy No. 5 remelted.
[b]Analysis not made. Manganese bronze.

TABLE 2—RESULTS OF TESTS

Alloy No. 1—Copper-Tin; New Metal; Not Remelted

Test bar	Diameter of test specimen, in.	Tensile strength lb. per sq. in.	Elongation in 2 in., per cent.
1	0.505	40,800	28.0
2	0.505	43,250	32.0
3	.....	.....	.....
4	0.798	35,720	24.5
5	0.505	33,750	22.5
6[a]	.....	.....	.....
7	0.798	33,080	21.0
8	0.505	34,600	24.0
Average	.....	36,866	25.3

[a]Speciment broke in lathe.

Alloy No. 2—Copper-Tin; New Metal; Pigged and Remelted
Temperature of Metal, 2300 deg. F.

1	0.505	51,250	42.5
2	0.505	50,300	40.5
3	0.798	40,660	23.5
4	0.505	50,400	39.0
5	0.798	32,740	14.0
6	0.798	28,560	9.5
7	0.798	34,200	16.0
8	0.505	40,550	28.0
Average	.....	41,201	26.6

Alloy No. 3—Copper-Tin; New Metal; Not Remelted
Temperature of Metal, 2100 deg. F.

1	0.505	44,150	42.0
2	0.505	38,250	30.0
3	0.798	36,460	27.0
4	0.505	40,350	31.0
5	0.505	36,600	27.0
6	0.505	37,200	30.0
7	0.505	27,050	17.5
8	0.505	39,100	40.0
Average	.....	37,395	31.8
Green-sand mold, average	.....	35,190	30.5

Alloy No. 4—Copper-Tin; New Metal; Not Remelted
Temperature of Metal, 2200 deg. F.

1[b]	0.505	27,200	2.5
2	0.505	42,500	15.0
3	0.798	32,040	6.0
4	0.505	39,700	11.0
5	0.505	34,250	11.0
6	0.505	20,700	1.5
7	0.505	32,250	7.5
8	0.505	37,750	14.0
Average	.....	34,170	9.4
Green-sand mold, average	.....	33,502	11.0

[b]Defective test; not included in averages.

Alloy No. 5—Copper-Zinc; New Metal; Not Remelted
Temperature of Metal, 1800 deg. F.

1	0.505	39,450	34.0
2	0.505	38,000	29.0
3	0.505	43,180	42.0[a]
4	0.505	34,300	25.5
5	0.505	41,950	46.0
6	0.505	41,450	40.0
7	0.505	42,750	47.0
8	0.505	43,300	49.0
Average	.....	40,548	39.0

[a]Defective for diameter = 0.798 in.

Alloy No. 6—Copper-Zinc; Alloy No. 5 Remelted
Temperature of Metal, 1840 deg. F.

1	0.505	49,250	40.0
2	0.505	44,000	25.0
3	0.798	48,200	37.0
4[b]	.....	.....	.....
5	0.505	50,000	48.0
6	0.505	49,250	47.0
7	0.505	49,800	45.0
8	0.505	50,000	46.0
Average	.....	48,650	41.1
Green-sand mold, average	.....	48,421	35.0

[b]Defective test.

Alloy No. 7—Copper-Zinc; New Metal; Not Remelted
Temperature of Metal, 2100 deg. F.

1	0.505	31,450	39.5
2	0.505	30,850	44.0
3	0.798	31,400	37.0
4	0.505	32,200	52.0
5	0.505	29,000	52.0
6[c]	.....	.....	.....
7	0.505	28,900	55.5
8	0.505	31,700	44.0
Average	.....	30,786	46.0
Green-sand mold, average	.....	29,435	47.0

[c]Defective test.

Alloy No. 8—Copper-Zinc; New Metal; Pigged and Remelted
Temperature of Metal, 1800 deg. F.

1	0.505	69,150	32.5
2 (not cast)	.....	.....	.....
3	0.698[d]	69,990	29.0
4 (not cast)	.....	.....	.....
5	0.798	68,880	29.0
6	0.798	31,780	1.5[e]
7	0.798	68,740	29.0
8	0.505	67,850	25.0
Average	.....	68,922	28.8

[d]Specimen defective for diameter of 0.798 in.; was turned down to 0.698 in.
[e]Defective test; not included in averages.

Alloy No. 9—Copper-Zinc; New Metal; Pigged and Remelted

1	0.447	73,885	26.0
2	0.505	73,200	26.0
3	0.798	73,100	24.0
4	0.798	72,800	26.0

Alloy No. 10—Copper-Tin; New Metal; Not Remelted
Temperature of Metal, 2100 deg. F.

1	0.505	33,000	16.0
2	0.505	40,600	28.5
3	0.798	31,480	16.0
4	0.505	28,950	10.0
5	0.505	25,750	12.5
6	0.505	27,150	16.0
7	0.505	20,600	9.0
8	0.505	40,150	48.0
Average	.....	30,960	19.5
Green-sand mold, average	.....	32,070	20.2

With some alloys a green-sand mold was made. This mold was filled immediately after the dry-sand mold was filled. The metal for both molds was poured from the same crucible. The castings made in green sand gave results that showed no decided variation from those made in the dry sand. The green-sand molds were soon discontinued. Only the average results from the green-sand blocks are given in Table 2.

CONCLUSIONS

On comparing the different tests we can conclude that the 88-10-2 test specimen as shown in Fig. 1 is convenient to use on copper-tin alloys. Incidentally, it may be noted that the average strength as given in Table 2 is approached by the strength of specimens Nos. 3 and 8 for the copper-tin alloys, and by No. 8 for the copper-zinc alloys. The 88-10-2 specimen with its narrow gate was attached to a block of manganese bronze with no success. The gate was then widened to the thickness of the test specimen at the middle as used on the blocks for alloys Nos. 8 and 9. The adopted test specimen for manganese bronze (0.505 in. diameter) took the form shown in Fig. 3 (*b*). The 88-10-2 specimen was not successful with brass due to small cracks forming in the specimen. These small cracks were not noticeable until the specimen was tested. The rate of freezing appears not to affect the copper-zinc alloys to as great an extent as the copper-tin alloys. The strength of alloy No. 2 varied from a tensile strength of 51,250 to 28,560 lb. per sq. in., while that of alloy No. 7 varied from a strength of 31,700 to 29,000 lb. per sq. in. With this copper-zinc alloy no cracks developed in the test specimens Nos. 1, 2, 3 and 4.

Considering a test specimen to represent the strength of a copper-zinc alloy, we can choose such a specimen as Nos. 5 or 6 for a diameter of 0.798 in., or No. 8 for a diameter of 0.505 in. (the specimen shown in Fig. 3 (*b*) is identical with No. 8). But when the copper-tin alloys are considered we can not make a choice. In a gear blank made from 88-10-2 metal, the surface of the metal is cut away to form the teeth of the gear. It is evident that the strength of the teeth could not be represented by test specimens Nos. 1, 2, 3 and 4. If a bar of the same metal is turned down to the size of a bolt, the designer's calculations must be based on the strength of the metal represented by specimens Nos. 5 and 7.

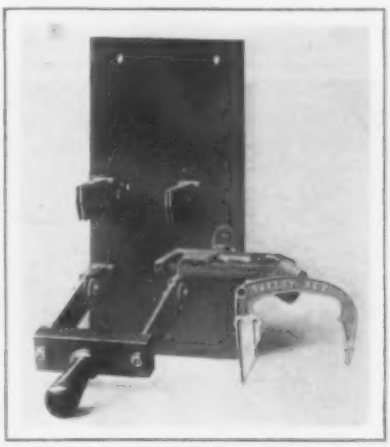
In this paper the author has endeavored to point out, with a limited number of tests, how the strength of metal varies with changes in the thickness of castings, what strength to expect from different alloys, and how a study was made of the different types of test specimens used in practice.

The Independent Steel Company Sold

At Kenova, W. Va., August 7, the property of the Independent Steel Company of America was sold by special commissioners appointed by a local court. J. W. Taylor, representing the holders of preferred claims amounting to $29,088.42, was the successful bidder at $35,000. This sale, if confirmed, will mean a loss to the mortgage holders of $169,000. The plant, according to evidence introduced before a master in chancery, cost $553,000. The company was organized in 1910 under the promotion of Arthur Hirsh, of Chicago, who interested local business men, principally of Huntington, W. Va., in the erection of a plant for the manufacture of steel products. The venture was not successful, and the forced sale above reported is the result. The property would have been sold nearly two years ago but for the intervention of some of the creditors and the necessity of settling this litigation to enable the close of the proceedings.

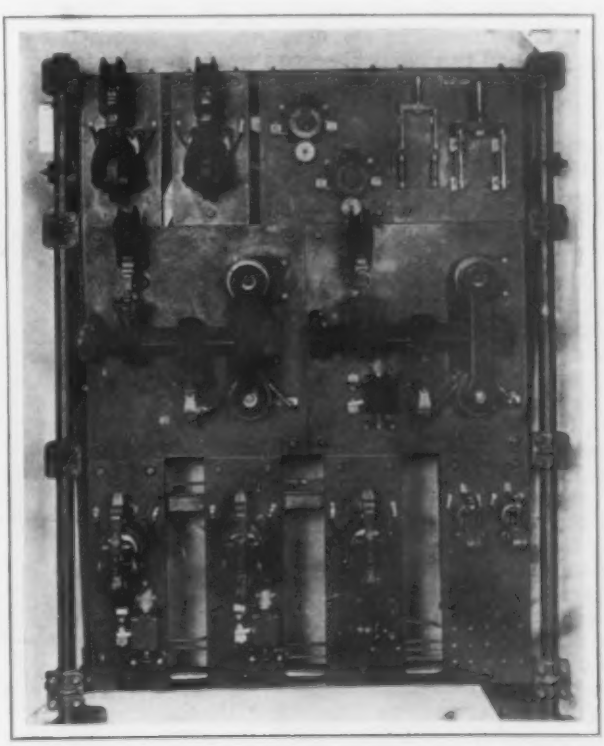
New Controllers for Electric Cranes

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has placed on the market a line of magnet switch crane controllers. Included in it are controllers for single trolley, bridge or hoist motors, or for a combination of motors in series or in parallel. The controllers for the bridge motors are designed for use either with or without speed control and this is true also of the hoist motors, except that the latter may have dynamic braking if desired, to give the operator complete control over the load. It is pointed out that the controllers are characterized by reliability, durability and simplicity. The parts are but few in number, and it is practically impossible for the magnet switch contacts to stick together. An effort has been made to reduce the number of interlocks with a large number of contacts and complicated connections as much as possible. Each switch is mounted on its own slate base and the entire number is assembled on a pipe framework, as is shown in one of the illustrations.



The Safety Key Used to Lock the Main Line Switch Open

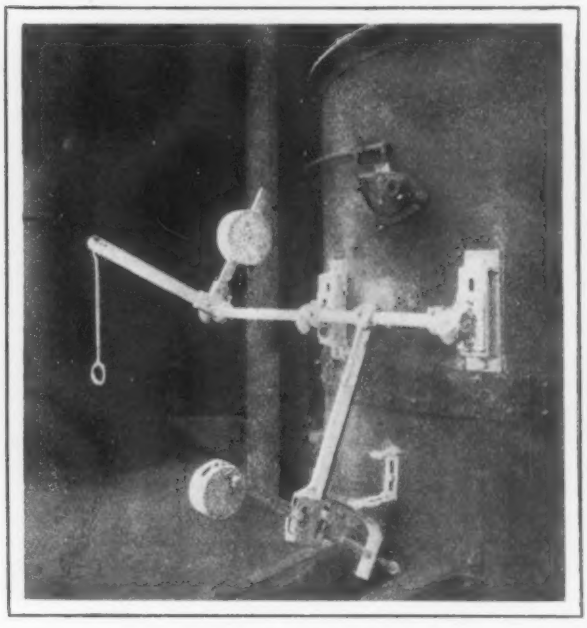
Two overload relays, one on each side of the line, provide protection against overloads, and after the relays have operated they are reset automatically by bringing the master switch to the off position. The placing of these relays on both sides of the line is relied upon to prevent any failure to



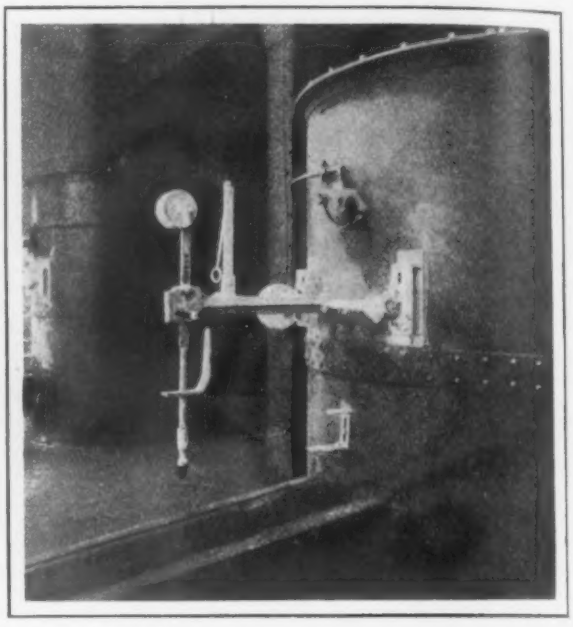
The Board Employed for Mounting the Various Protective Devices Used in the Control of Electric Cranes

operate by reason of grounded wires. In the event of the supply voltage failing, the control circuit is opened by a no-voltage release, and the motor cannot be started until the master switch is returned to the off position.

Inspection and repair of the wearing parts of the controller can be easily made, which it is emphasized results in very little time being lost on account of controller repairs. A special device is employed for locking the main line switch, to guard against accidents during the inspection and repair of the crane apparatus. When this safety key, which is shown in the smaller of the accompanying illustrations, is removed, the switch is locked open. There are a number of holes provided in the mounting of the switch for padlocks to prevent the insertion of the safety key and the closing of the line switch before the proper time. In use it is intended to have padlocks inserted by the various men working on the apparatus, the idea being to have each man remove his own padlock when he has finished the portion of the work upon which he has been engaged, and for the man removing the last padlock to insert the safety key.



New Tapping Device with Tapping Hole Closed



New Tapping Device with Tapping Hole Open

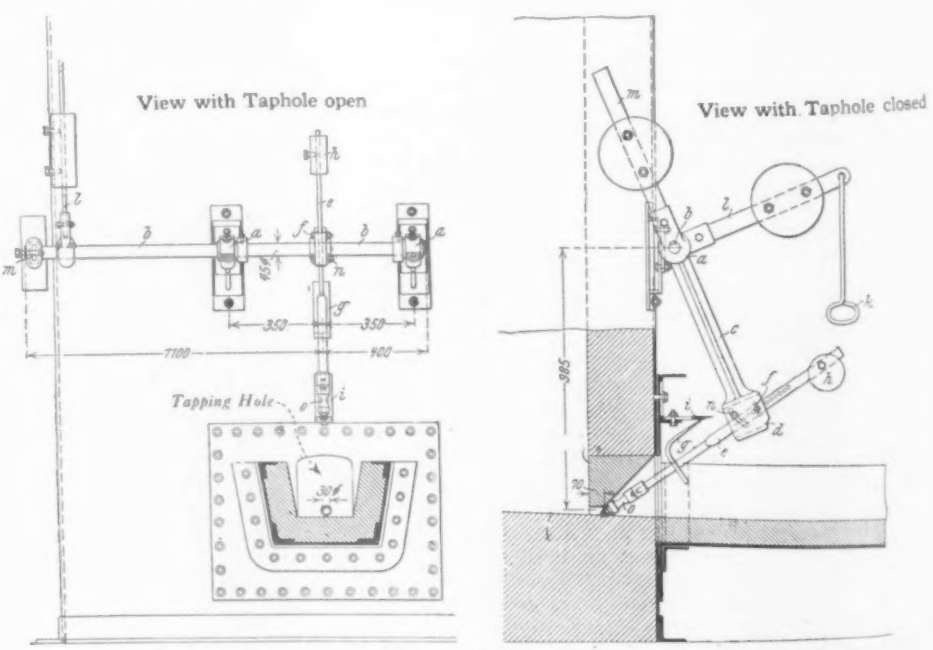
The Western Malleables Company, Beaver Dam, Wis., virtual successor to the Beaver Dam Malleable Iron Company, bankrupt, which has been operating but two of its four plants since the reorganization, on August 3 resumed operations in the third works, the South Street plant, adding 150 men to its payroll. The company specializes in railroad malleable work and expects enough orders in the course of the fall to make necessary the reopening of the fourth plant.

NEW CUPOLA TAPPING DEVICE

A German Mechanism for Opening and Closing Tap Holes Efficiently and Safely

In the issue of Stahl und Eisen for May 28, R. Fichtner, of Duisburg-Wanheim, describes a mechanical arrangement for opening and closing cupola tapping holes. The three cupolas at the plant with which Mr. Fichtner is connected have been equipped with the device—one a 10-ton furnace, for about nine months, and the others, 5-ton furnaces, for about six months. It is giving complete satisfaction, and especially because of the avoidance of all accidents to the men due to tapping.

The arrangement is shown in the illustrations. A shaft *b* is supported by two bearings *a* fastened to the mantle of the cupola or forehearth. To this shaft the arm *c* is solidly keyed on, in the head of which *d* is carried the movable rod or dolly-bar *e*. This rod is provided with a finger



Arrangement for Opening and Closing Tapping Hole with New German Device

or guide *g* to insure its proper direction and the certain closing of the tapping hole. Under the influence of the counterweight *b* when closing the hole, this guide engages with a gauge *i* which can be regulated as to position, and the stopper goes just where it should. The actual operation is carried out by a gentle pull on the handle, *k* (attached to the lever *l* which is keyed to the shaft *b*) until *g* and *i* strike each other, then a forceful pull effectively closes the hole. The stopper itself is carried on the cast-iron piece *o* which fits on the end of *e* with a dovetail joint. Several of these should be provided so that when the cupola hole is opened the hot one can be removed with tongs and replaced by another carrying its clay stopper. The clay used should be such that under the influence of heat it bakes hard and closes solidly around the piece, *o*. A simple mold is used for making the stoppers to have them uniform in size and shape, which is of considerable importance.

Special attention may be directed to the fact that the man operating the lever, *l*, is considerably removed from the tapping hole and spout, and therefore from danger of being burned. No great monetary saving can be brought about, but Mr. Fichtner points out that any handy man can operate the machine, thus dispensing with the need of the higher paid cupola tapper. The work also is made much easier, which is important in hot weather. In many cases the tapping hole does not need to be made up every day, which means a saving in material, time and labor.

In a short discussion the safety provisions of the device were strongly commended, and several foundry men gave evidence as to the good working of the device in their own foundries. G. B. W.

FOUNDRY CONVENTION PAPERS

A Schedule of Six Groups—The Programme of Entertainment

As the time in which space could be secured in the exhibit of foundry and machine equipment to be held in Chicago September 5 to 12 came to a close, the most reliable evidences of the interest of the exhibitors became apparent. Both in the number of applicants and in the amount of space taken there are indications that this fall is looked upon as an opportune time for making a hard drive to secure a larger volume of business for the coming winter and ensuing year. There is every reason to believe that the 1914 exhibition will have more to offer for the visitor than any previous one.

The programme thus far prepared also promises for the meetings of the American Foundrymen's Association and the American Institute of Metals an exceptional offering of technical material. An unusual effort has been made by the executive committees of these associations to make the sessions of value and so to arrange that those in attendance may secure the greatest benefit by conserving their time for the topics in which they are especially interested. A preliminary list of papers already provided for includes the following:

Safety Work

"Safety in Foundry Operations," by M. W. Alexander, General Electric Company, West Lynn, Mass.

"Safety First," by W. F. Riedenbach, Genesee Metal Company, Rochester, N. Y.

"Progress in the Safety First Movement," by Arthur T. Morey, Commonwealth Steel Company, St. Louis.

"Safety in Connection with Grinding Wheel Operations," by R. G. Williams, Norton Company, Worcester, Mass.

"Safety and Sanitation," by A. W. Gregg, Bucyrus Company, Milwaukee.

"Safety First—Driving Back the Saloon," by Thomas D. West, Cleveland.

"Safety and Sanitation As Applied to the Brass Industry," by F. Moerl, Chicago.

Foundry Equipment and Appliances

"Electric Motors and Controllers for Foundry Operations," by S. H. Libby, Chicago.

"The Second Story Foundry," by G. K. Hooper, Hooper-Falkenau Engineering Company, Detroit.

"Economics of Motor Drive," by H. F. Stratton, Electric Controller & Mfg. Company, Cleveland.

"Abrasives in the Foundry," by Mr. Dietz, Norton Company, Worcester, Mass.

"Refractory Material," by Mr. Kelly, Harbison-Walker Refractories Company, Pittsburgh.

"Molding Sand Tests," by Dr. Richard Moldenke, Watchung, N. J.

Cost Congress

"Foundry Cost Keeping," address by F. J. Stevenson, Cost expert, National Association of Stove Manufacturers, Hoosick Falls, N. Y.

"Efficiency in Foundry Operations the Essential Factor in Reducing Production Costs," address by A. K. Hathaway, Tabor Mfg. Company, Philadelphia.

"Efficiency in Foundry Work," by F. A. Parkhurst, Aluminum Castings Company, Detroit.

"Revision of the A. F. A. Standard Foundry Cost System," by Harrington Emerson, 30 Church street, New York City.

"Prevailing Practice in Estimating the Selling Price of Castings," by A. O. Backert.

Malleable Castings

"Manufacture of Malleable Cast Iron," by Harrold Hemenway, H. W. Copper Saddlery Hardware Mfg. Company, Moline, Ill.

"Effect of Silicon and Carbon in Malleable Iron Practice," by A. L. Pollard, Johnston Harvester Company, Batavia, N. Y.

"Tests of Malleable Cast Iron," by Enrique Touceda, Albany, N. Y.

"Malleable Iron Practice," by J. P. Pero, Missouri Malleable Iron Company, East St. Louis.

"Researches in the Annealing Process for Malleable Castings," by Oliver W. Storey, University of Wisconsin, Madison, Wis.

Steel Castings

"The Electric Furnace in the Steel Foundry," by W. L. Morrison, Welland, Ont., Can.

Discussion of Mr. Morrison's paper, by G. J. Stock, Darlington, Eng.

"Making Steel Direct from Ore in the Electric Furnace," by Prof. T. A. Louden, Toronto.

"Side-Blow Converter Practice," by John Gregson, Sivyer Steel Casting Company, Milwaukee.

"Manufacture of Acid Steel for Castings," by A. F. Blackwood, Detroit.

"Notes on the Microstructure of Steel," by Prof. William Campbell, New York.

"Some Defects in Steel Castings and Remedies for Them," by John Howe Hall, New York.

"Report of the Committee on Steel Foundry Standards," by the chairman, Dudley Shoemaker, American Steel Foundries, Indiana Harbor, Ind.

Gray Iron Castings

"Cast Iron with Unusual Structure," by K. W. Zimmerschied, General Motors Company, Detroit.

"Elimination of Waste in Bench Molding," by J. C. Pendleton and R. E. Kennedy, University of Illinois, Urbana, Ill.

Report on the Conservation Congress, by Paul Kreuzpointner, Altoona, Pa.

Report of the Committee on Industrial Education, by Paul Kreuzpointner, Altoona, Pa.

"Iron and Its Properties," by Peter F. Blackwood, Michigan Steel Castings Company, Detroit.

"Green Sand Cores," by James Mulvey, Rensselaer Valve Company, Troy, N. Y.

"Dangers of Specialization," by Thomas D. West, Cleveland.

"Semi-Steel," by R. H. Probert, James Leffel & Co., Springfield, Ohio.

"Tests of Cast Iron," by W. P. Putnam, Detroit Testing Laboratory, Detroit.

Memorandum on the Preparation of Standard Specifications for Cast Iron for International Export Use," by Dr. Richard Moldenke.

"Industrial Pioneering, or the Establishment of a Foundry in a New Territory," by L. L. Anthes, Anthes Foundry Company, Toronto.

The executive committee of the American Foundrymen's Association will meet in Chicago August 15 and 16, when the plans of the local committees for the entertainment of the convention will be approved. These entertainment features are arranged as follows:

Monday evening, September 7, banquet to the Asso-

ciated Foundry Foremen, at the Hotel Dearborn.

Tuesday, 2 p. m., ladies' luncheon, Saddle and Sirloin Club.

Tuesday, 7 p. m., lake ride, steamer Roosevelt.

Thursday, 7 p. m., annual banquet, Allied Foundrymen's Association, Hotel La Salle.

Thursday, 7 p. m., ladies' dinner, Hotel La Salle.

Provision has also been made for a trip to Packingtown and for complimentary admission to the White City at any time during the week; also, for a trip to the steel works at South Chicago and Gary and for inspection trips to the interesting foundries of the Chicago district.

MISTAKES IN FACTORY WORK

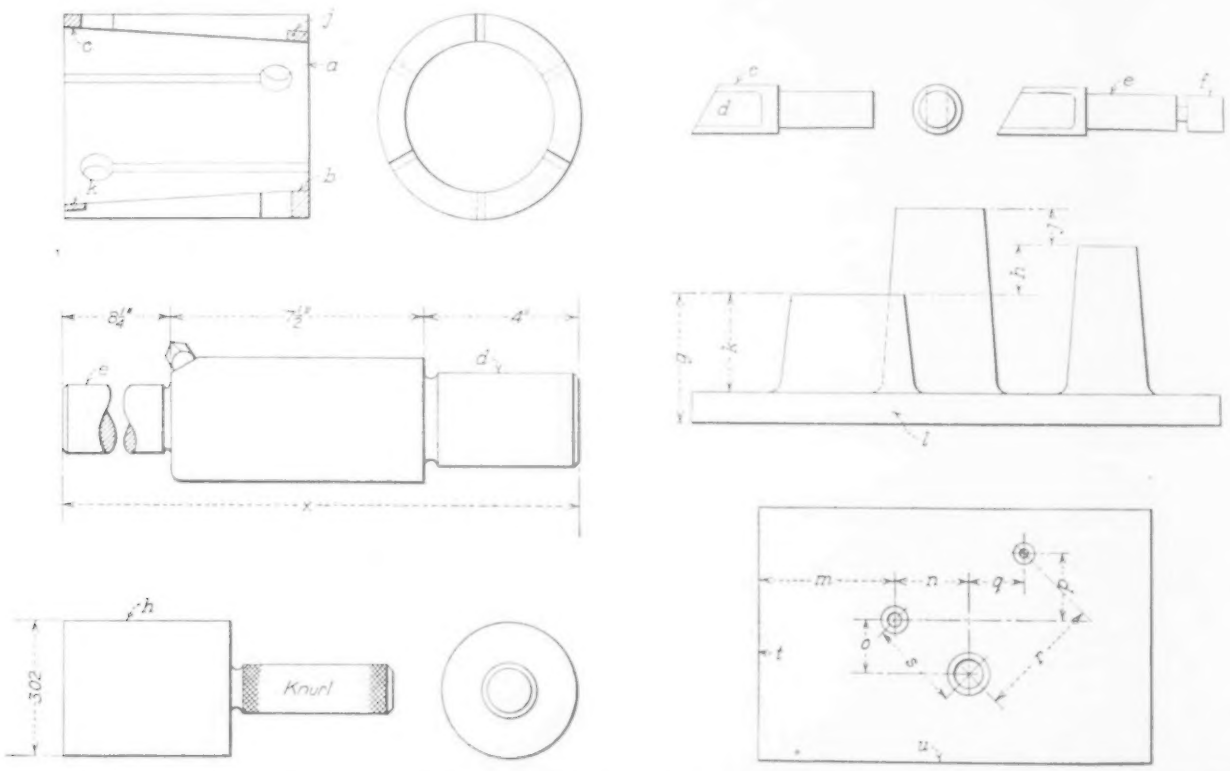
Their Causes and Effects with Some Suggestions for Remedying Them

BY ALBERT A. DOWD

Mistakes of various kinds are a daily occurrence in factory work and are a constant source of annoyance to foremen or others who may be called upon to decide regarding their seriousness. In the majority of cases the mistakes are trivial and can be rectified in one way or another without a great amount of trouble. It occasionally happens, however, that there is no remedy and when this is the case it becomes necessary to make an entirely new piece and scrap the work which has been spoiled. Slight variations in machined surfaces are occasionally found in the regular production of the factory and these are naturally taken care of by the inspector and reported to the proper foreman. Mistakes of this kind are often the result of dull tools, errors in setting up work, and negligence in working to machine stops on the part of the operator. Remedies for mistakes of this kind are obvious. Special work, when a single piece only is to be machined, is more frequently the cause of trouble due to mistakes in machining. Tools, jigs, fixtures and special devices of every kind are especially subject to small errors which are traceable to various causes, and which often add considerably to the cost of the devices.

CARELESSNESS THE MOST PROLIFIC SOURCE OF ERROR

Undoubtedly carelessness is by far the most frequent cause of errors in machining. This carelessness may be manifested in a number of ways; an error in reading a blueprint, haste in machining, by trying to make two cuts serve when three are needed, clamping work so that it is distorted during the process of machining giving incorrect results when released, incorrect reading of scale or micrometers and machine tools in such condition as to cause bad work. All these points represent carelessness on someone's part, and are the direct cause of the majority of shop errors. Some of the other causes are accumulated errors caused by slight variations in working from several surfaces instead of using a single surface from which all dimensions are set; mistakes in the pattern, rather rare, but there are occasional instances when finish allowance is forgotten, a lug left off, or an error in locating a boss or pad, and mistakes on blueprint or errors



Some Examples of Pieces Upon Which Mistakes in Machining Have Been Made Due to Incorrect Reading of Scales or the Omission of Dimensions

in design are also found from time to time and may not be discovered until too late to remedy so that work has to be done all over again. An off-scale drawing is a frequent cause of trouble, for the average man in the shop gets his insight into the drawing mostly by looks. In spite of the caution on most drawings, the workman frequently uses his scale when he should not and it is evident that much trouble is caused by this proclivity on his part. I once made a small freehand sketch in the factory, while the toolmaker was looking on, for a change in design of a jig that he was making, to save the delay incident to taking the drawing away while the changes were being made. Inadvertently one dimension was left off, and as I was passing by an hour or two later the toolmaker asked me what it was, saying, "I made it 1⅝ in. for that was about what it scaled." It so happened that this dimension was not vital and made no serious trouble, but the fact that the workman actually

scaled a freehand sketch that had been made directly under his observation, is of interest in showing the trouble which might have arisen on account of this tendency to scale a drawing to obtain an unknown dimension.

The upper left illustration is an ordinary tapered split bushing such as is commonly used on an expanding arbor. This bushing is split in six places, three cuts being made from one end and the other three from the other end. Now if a bushing of this kind is not to be hardened it may be machined up just as called for on the drawing, but when it is to be hardened, as is usually the case, the ends must be left tied together as shown at *j* and *k* so that the piece will keep its shape during the process of hardening and tempering. The final grinding also requires it so that the work can be properly held during the operation. After the piece has been ground to size, the ties are cut out with a thin grinding wheel and the bushing is ready for use. I have known of a number of instances where the tie was insufficient to withstand the shock of sudden cooling during the hardening process, the result being a rupture at this point, so that its value was destroyed for grinding purposes. The amount of stock left should always be ample to withstand such strains.

A very common source of errors in the shop is shown in the boring bar *d*, in which the pilot *e* is broken to economize space on the drawing, and in addition to this the over-all dimension *x* has been left off. Now it so happens that when the stock was ordered, the dimensions were totaled to obtain the over-all length and an error of an inch was made so that the stock when received was just that much too short. The workman who was making the bar turned up the two ends to dimensions given, thus making the body which called for 7½ in., only 6½ in., and as he worked from each end he did not notice the discrepancy. Naturally the bar could not be used as the body portion was not long enough. The mistake in ordering the stock caused all the trouble but an error of this kind would have less likely to occur if the over-all dimension *x* had been given or if the drawing of the bar had not been broken.

Another cause of errors in the factory is the marking of drawings in a way which is susceptible of being taken wrongly. Take the plug gauge shown at *h* for example. It will be noticed that the diameter is marked 3.02 in. instead of 3.020 in. as it should be. It may be argued that the final 0 has no value and therefore there is no use in putting it at the right of the decimal point. However, it will be found that the workman is just about as likely to make an error here as he is to get it right. He will be very apt to make this plug gauge 3.002 in., as he is continually working in thousandths, and although he knows better if he were to stop and think a moment, the error will frequently be made just the same. When dimensions are in thousandths of an inch it is much safer to give the three places of decimals although the last figure may apparently have no actual value. The chances of error are much lessened if this procedure is followed.

SOME RESULTS OF INCORRECT READING OF DRAWINGS

Occasionally a workman reads a drawing incorrectly with serious results, although he may be usually a careful man. I have seen several instances where a man has read the figures on a drawing correctly and yet has gone ahead and machined the work to other figures under the impression that he is working to the correct dimensions. One such case came under my observation several years ago and it was only by the greatest piece of good fortune that the work was saved from the scrap-pile.

An example which serves to show the value of forethought is shown at *c*. There were 18 pins of tool steel which were to be made up like this, hardened and ground to a running fit on the two diameters. The stock was ordered cut off in lengths ⅛ in. longer than the finished pieces were to be. When the workman received the stock he complained to the foreman that the pieces were not long enough to allow for a dog in grinding the two diameters, and said he would have to make two settings for each piece in order to grind them. The stock was therefore ordered over again, each piece being cut off long enough to allow for a dog so that both diameters could be ground at the same setting. The piece *f* was knocked off with a hammer after the work had been done, leaving the pin as at *e* with a slight teat where the end had been broken off. As the ends of the pins were to be ground to a uniform length this made no difference whatever, and there was a considerable saving of time in machining.

GIVING ALL THE REQUIRED DIMENSIONS

In jig and fixture work there are occasional errors which can be prevented and are not strictly speaking the result of careless workmanship. One of the sources of error is the accumulation of small variations caused by working from several different surfaces. There are many cases when this variation does not cause trouble because the accuracy required is not close enough to make the matter serious. An example which illustrates the possibilities of errors of this kind is shown in the fixture *l*. It will be seen that the dimensions *g*, *k*, *h* and *j* are all given from different surfaces, and if the workman, in machining these surfaces, follows the same method of working from one surface to the other instead of getting all his dimensions from the same base line, there is apt to be an accumulation of errors which will change the finished surfaces somewhat. It may be argued that a good workman would be sure to work from a single base line, and this is to a certain extent true, but if the workman does this he must obtain his dimensions by adding the figures on the drawing, thus making one more chance for an error in figuring. The real seat of the trouble is in the drafting room, for here the drawing is made and the figures should be put on in such a way that the workman will not be obliged to do any figuring at all.

Another example along the same general lines is shown in the jig plate at the lower right portion of the illustration. In this instance the two angular dimensions *s* and *r* were left off the drawing so that the workman was obliged to figure them for himself. In addition to this, the dimensions *m*, *n* and *q* might have been given from the base line *t* and the dimensions *o* and *p* from the base line *u*, thus doing away with the necessity for the toolmaker figuring. Each person who is obliged to do any figuring on a drawing adds one more to the chances of error in the finished work, so that it is always wise to so make the drawings that no figuring need be done outside the drafting room.

The Giddings & Lewis Mfg. Company, Fond du Lac, Wis., manufacturer of saw-mill machinery and special equipment, has put on a night crew to take care of its increased business. Orders coming in are of considerably larger volume than those entered at this time last year.

Theory and Practice of Sherardizing

Utility of Several Methods of Testing Galvanized, Sherardized and Electroplated Coatings—The Preece, Lead Acetate and Other Tests Discussed

BY SAMUEL TROOD*

The Preece Test.—Cushman and Gardner, "Corrosion and Preservation of Iron and Steel," page 130, give in detail the rules adopted by the American Telegraph & Telephone Company in conducting this test. The solution is made up by dissolving 36 parts by weight of commercial copper sulphate crystals in 100 parts of water and then neutralizing by the addition of excess of chemically pure cupric oxide. The presence of excess oxide is indicated by the undissolved part settling to the bottom of the vessel.

It is difficult and takes much time to get the copper sulphate into solution at room temperature, even if the solution is agitated by blowing air through it, or if the crystals are suspended in a basket near the top of the solution. Heating will greatly accelerate the rate of solution, and in this way a solution can be prepared a little stronger than that desired, the final exact adjustment being afterward made by diluting with water. To do this accurately and rapidly, add a certain number of cubic centimeters of water to about 5 liters of solution, and note how many thousandths change this produces in the specific gravity. One or two further additions will then suffice to get an accurate adjustment of the strength.

It was noted that, after the finished solution has been filtered off from the copper oxide, CuO, in the bottom of the stock bottle, there is separated out, sometimes a reddish or sometimes a bulky pale green precipitate, after the solution has stood for a considerable time, due to some impurity, or it may be to some basic salt of copper. It probably does not affect the strength or neutrality of the solution appreciably, since the quantity is not great. However, for very accurate work it might be desirable to determine the effect of this change, and whether it is desirable to always use a solution recently filtered off from CuO sediment.

The descriptions of the test specify that the strength of the solution shall be 1.186 at 65 deg. F. It would be desirable to know the permissable variation from this, that is, the error due to having the strength 1.184 or 1.188, for example; further, it would simplify the operation of making up the solution, if only an occasional one is made up and means for getting the temperature exactly adjusted are not convenient, to know what specific gravity to aim for if the temperature is 70 deg. or 80 deg. F. After the strength has once been adjusted, the temperature at which the solution is used has an effect upon the accuracy of the test. This will be taken up in another paragraph.

MANIPULATION OF THE TEST

Several sets of specifications on the manipulation of the Preece test, as applied to hot galvanized and electro-galvanized objects, are given in Cushman and Gardner, pp. 131-135. There does not seem to be published information on the one point that determines whether or not the operator will have success when he attempts to apply the Preece test to sherardized and alloy-coated articles. This is that the specimen must be brushed instead of wiped, in removing the loose copper after each dip.

The copper which replaces the zinc on a galvanized coating is in such a loose non-adherent form that it can be easily wiped off with cotton waste, but that which forms on sherardized coatings is more adherent, probably due to the slower rate at which zinc-iron alloy precipitates copper from the solution as compared with zinc itself. Further, the sherardized surface is rough so that, if the specimen is wiped with waste, the copper, instead of being removed, is rubbed into the hollows of the surface. This copper then protects the still remaining underlying alloy from further action of the solution and the test is spoiled. The further solution of the protected alloy is retarded so that, if the dips are continued, the specimen will appear to stand more dips than correspond to the thickness of coating present or even may stand an indefinite number of dips. On the other hand, if the operator has not had some experience, he may interpret this premature appearance of copper as a failure, since after several burnishings by waste, the copper on alloy may take a polish that resembles closely the appearance of copper formed on the iron. By removing the copper after each dip by vigorous brushing with plenty of water, as under a faucet, the risk of rubbing it into the hollows is practically eliminated.

In a sherardized specimen the portion of the coating next to the iron shows a lighter color during the Preece test than that nearer the surface. For this reason, then, when, after brushing and drying, a light patch shows up on a darker background, it indicates that the coating is thin at that point and failure is to be expected. Sometimes, due to imperfect brushing, copper will form on the surface of the coating, as mentioned, but this copper can be distinguished from the copper formed on the iron at the point of failure in several ways. The copper at the failure is lighter in color than that due to improper brushing, it is surrounded by an area of light colored coating and it forms in the hollows or "valleys" of the coating, while the other forms on the higher portions or "hill tops." This last difference is always noticeable under a magnifying glass, but it can be distinguished by the eye after a little practice.

The regular Preece test was made on some No. 16 gauge wire which had been given a sherardized coat in such a manner that it was very smooth. It was noticed that the copper which formed could be wiped off with waste and that the test would give the same results whether the wiping was done by waste or by brush. In order to determine whether the character of the coat affected this, similar tests were made on sherardized sheet. One sheet had a rough coat while the other was smooth. Both were dipped at the same time in the same solution and both were wiped with waste. After the fourth dip the copper which had deposited on the rough specimen was rubbed into the crevices of the surface and gave a

*Consulting engineer, New Castle, Pa. What sherardizing really is, defining the process for the first time in a satisfactory way scientifically, was described by Dr. Trood, in *The Iron Age* of July 23. In the second article, in *The Iron Age* for July 30, he discussed practical points in operating a sherardizing plant. In the last issue he described and illustrated a typical sherardizing plant. In the next issue the final article will treat of the methods adopted to improve a plant not operating successfully.

copperish color to the specimen. Large patches of this copper were burnished to a metallic polish. The copper which had deposited on the smooth piece showed practically no tendency to remain, as there were few cracks or hollows in which it could form.

A specimen of sherardized sheet 2½ x 4 in., with a very thick sherardized coating, was dipped into a solution 2 inches. One-half of the tested part was brushed after each dip and the other half was wiped with waste. After the third dip fine copper began to collect on the wiped half in the crevices of the coat and the amount increased after each dip. The brushed side kept a uniform dark color through the entire test showing no deposition of copper. The copper formed on the wiped half became thicker after each dip. The sherardized coating where it was not protected by this layer of copper became thinner and eventually failed. The appearance of the coating on the brushed half was uniform and showed no indication of failure. The elevated deposit of copper on the wiped half could be flaked off. The premature failure of the wiped half was due to the accelerating action of the heavy elevated deposit of copper; that is to say, the burnished copper on the alloy protects only the alloy directly beneath it, but accelerates the solution of immediately adjoining areas of alloy. The elevated copper had a nodular rough surface while that deposited on the iron at the failure was smooth and bright.

TEMPERATURE OF THE SOLUTION

The American Steel & Wire Company specifies that in carrying out the dip test the temperature of the solution must be between 65 and 70 deg. F., while the American Telephone & Telegraph Company specifies 62 to 68 deg. F. It is of interest to know the percentage of error due to temperature variations, especially when only an occasional test has to be made, since it may then take much more time to arrange to get the right temperature than to run the tests. Results obtained with solution at different temperatures, 75 c.c. of solution being used, are:

Temperature	Average loss, gr. per sq. in.
55 deg. F.	0.0291
65 deg. F.	0.03185
75 deg. F.	0.0345
85 deg. F.	0.0397

These figures show that if a specimen is very close to the point of rejection a difference of 10 degrees may easily mean rejection or acceptance for the same actual thickness of coating.

CONSIDERATION OF OBJECTIONS TO PREECE TEST

The accuracy of the Preece test has been called into question by Patrick and Walker (Journal of Industrial and Engineering Chemistry, April, 1911), for the reason that the rate at which $CuSO_4$ solution dissolves zinc is different from the rate of solution for zinc-iron alloy. The rate of solution is slower for the zinc-iron alloy because of its lower potential as compared with zinc. But this lower potential would seem to indicate a correspondingly slower corrosion by atmospheric influence, so that the number of dips in a corrosive solution that a specimen will stand is a fairer indication of its resistance to corrosion, and therefore the usefulness of the coating, than the actual weight of the zinc present. It is a determined fact that less weight of zinc in the form of sherardized coat will afford protection equal to a greater amount of zinc in the form of a hot or electrogalvanized coating.

Determinations have been made of the relative rate of solution of several kinds of coating in the standard $CuSO_4$ solution with the following results:

Specimen	Loss, gr. per sq. in. per dip
Hot galvanized wire	0.0135
Alloy coated nail (sherardized)	0.0082
Sherarduct	0.0109
Galvaduct	0.0131

It is evident that the sherardized coat dissolves materially more slowly.

In comparing one specimen of hot galvanized material with another, there may be a slight discrepancy in the relation between the number of dips and the actual weight of coating. This is due to the fact that in different specimens of hot galvanizing the ratio between alloy and pure zinc present may vary from something like 1 of alloy to 4 of zinc, to 1 of alloy to 10 of zinc. Again, it may be fairly assumed that the important thing to know is the number of dips the specimen will stand rather than the weight of material present. If, however, some buyer or manufacturer should consider weight the only factor of importance, it is evident that a difference of rate, as indicated in the above table, is not so serious when it is borne in mind that it applies only ¼ to 1/10 of the coating; further, when the Preece test is used as a regular commercial control by some buyer or manufacturer, the articles compared from day to day are probably usually so made that the variation in the proportion of alloy present is not a maximum one.

In the same article, Patrick and Walker assert that the end point is unreliable. As far as sherardized articles are concerned, practically all of this uncertainty as to the end point arises from the fact that the specimen is not brushed properly. The importance of this has been discussed under "Manipulation of the Test." It is true, however, that it takes more practice and more careful discrimination to use the Preece test for sherardized articles than for hot or electrogalvanized objects.

In order to get additional proof that really adherent copper deposits only upon iron and not upon alloy, specimens were prepared and examined under the microscope. It was noted that the only bright copper on the brushed specimen was on the iron, while the thin alloy surrounding the place of failure showed none whatever. Before brushing there was copper on this alloy.

Sellers of hot galvanized ware have raised objection to permitting the brushing of samples of sherardized ware, in carrying out the Preece test. As long as there is any coating left the brushing can certainly do nothing that would make the sherardized article show up better than it should; if anything it would remove some of the coating and hasten the failure, to which the sellers of galvanized ware would certainly not object.

The only possible contentions of the hot galvanized ware sellers would then be that the brushing might remove copper that is deposited upon iron. According to observations made on this point, only the most violent brushing will do this and there is not the slightest difficulty in avoiding it. The use of the stiffest brush that could be bought in a local drug store did not bring about the removal of this copper, and a much softer brush is perfectly sufficient to give the samples all the brushing they need, if only a burnishing effect is avoided.

Probably the only way in which there is danger of removing copper from iron is a bending back and forth or other considerable distortion of the specimen; or, after the coating has been removed and the next dip would deposit copper and iron, to get the specimen dirty or greasy by using a greasy or soapy brush or handling with the hands. If the sample is laid upon a board, in brushing, as may be desirable with light flexible objects, in order not to

scale off any copper, the board should of course be free from soap, grease, dirt or chemicals.

The Lead Acetate Test.—In preparing the solution used, difficulty was found in getting the prescribed quantity of lead acetate into solution. It is probable that by heating this solution would be facilitated. One difficulty encountered in working the test was due to the deposition of adherent lead on sherardized samples immediately on immersing, particularly those coated by dust. This adherent lead cannot be wiped off and protects the underlying coating from going into solution. The area of adherent lead on some specimens was over 90 per cent. of the total surface.

It was attempted to determine the loss of weight per dip before the remedy for obviating the formation of adherent lead has been found. A gain in weight instead of a loss was found, showing conclusively that adherent lead was formed. Test pieces consisting of sherardized nails with the points cut off were used. These were immersed each time to constant depth. The area of the surface exposed was therefore constant in each dip. The nails were cleaned in gasoline, washed and dried; one-minute dips; brushed lightly and dried after each dip.

During dip No.	Nail No. 1, gain in grams.	Nail No. 2, gain in grams.
1	0.0011	0.0014
2	0.0024	0.0020
3	0.0028	0.0014
4	0.0010	0.0003

A similar nail was dipped into the solution and only adherent lead formed. The nail was removed and a knife blade scraped lightly across the surface and replaced. Loose, black crystalline lead immediately formed on the scratched portion, while none formed on the other parts of the nail.

Two nails similar to those previously mentioned were dipped in the same manner after they had been brushed with a dry brush and wiped with a dry towel. The deposition of loose lead in this case took place in spots, but covering the lesser part of the surface. These spots grew slowly during the dip. The brushing after each dip was done lightly.

During dip. No.	Nail No. 1, loss in grams.	Nail No. 2, loss in grams.
1	0.0008	0.0036
2	0.0018	0.0029
3	0.0017	0.0051

As will be seen from the next determination, these are not normal results. Several other devices were tried to bring about the proper action of the solution. The specimens were thoroughly moistened, a hot solution was tried, the specimens were moved around in the solution, but no results were obtained.

In the next test the sample was treated before dipping with about 20 per cent. acetic acid for about 20 seconds, or until a distinct evolution of gas took place over its entire surface. After washing and drying it was dipped and weighed as in the previous test. The deposition of loose lead took place over the entire surface immediately after immersion.

During dip. No.	Nail No. 3, Loss in grams.	Nail No. 3, Loss grams per sq. in.
1	0.0201	0.0199
2	0.0163	0.0161
3	0.0138	0.0137
4	0.0141	0.0140

A similar test with a larger nail, dipped in acetic acid before putting into the lead acetate solution, gave the following results:

During dip. No.	Nail No. 4— Loss in grams.	Loss grams per sq. in.
1	0.0120	0.0235
2	0.0084	0.0165
3	0.0085	0.0167
4	0.0092	0.0180
5	0.0089	0.0174
6	0.0086	0.0169

Instead of dilute acetic acid, very dilute hydrochloric acid can also be used, about 10 per cent., and the specimen immersed in this about 10 seconds. It is probable that the reason that the lead acetate solution does not act properly at the start is that there is some zinc or iron oxide on the surface of the object.

Patrick and Walker do not approve of a "dip" method of testing the thickness of a coating, no matter what solution is used, but believe that the weight of the coating should be determined, either by weighing the lead deposit or by noting the loss of weight of the specimen. Either of these methods takes more time than that of counting dips, and the method of collecting, drying and weighing the lead seems especially cumbersome for a routine works test. The calculation of the results will take time also, unless there are a great number of samples of the same shape and size to be tested.

PREECE AND ACETATE METHODS COMPARED

1. For commercial testing the Preece method can be satisfactorily used for sherardized as well as for hot dip and electrogalvanized articles, if the specimens are brushed properly. It takes more practice to detect the end point for testing sherardized goods.

2. When used as a dip method the lead acetate test has the advantage of showing the end point with less practice on the part of the operator. It is troublesome for sherardized articles since the samples must be dipped in acid, as described, in order that the test can be worked.

3. The lead acetate solution removes about 1.6 times as much coating per dip as the copper sulphate solution. It would be desirable, in order to prevent confusion, to adjust the solution, if possible, so that a dip removes the same quantity in both cases. If a weaker solution is used in order to reduce the rate of solution for the lead acetate solution there may be more trouble with the formation of adherent lead.

4. As a testing method for scientific investigations to determine the exact weight of coating the lead acetate determination has the advantage that it removes the coating without depositing anything on the iron, resulting in an accurate determination. However the error due to the small amount of copper replacing iron cannot be material if it is desired to use the copper sulphate solution in order to determine the loss of weight of the specimen.

5. The lead acetate method affords a means of determining the percentage of iron in the coating. This is not essential for routine factory testing, and in fact the iron determination would be too troublesome for regular works control.

6. If it does not seem possible or desirable to overcome the objections of the sellers of hot galvanized ware to brushing sherardized samples during the Preece test, the lead acetate method may be a useful substitute or at any rate a good check method to show that brushing does not result in too favorable indications for sherardized goods when tested by the Preece method.

7. It does not seem justifiable to concur in Patrick and Walker's recommendation to substitute a weighing method for the dip method for commercial purposes, or to substitute the lead acetate dip method for the copper sulphate method.

ELECTROLYTIC METHODS

Some experimental work was carried on which showed that by removing a sherardized coating by electrolysis in a solution of potassium nitrate the ampere-minutes of current passed would indicate the weight of the coating. At this time the tests were all carried to the point of total removal of the coating.

If this method were modified, so that a constant amperage were used, and the specimen removed from the solution from time to time, say every half minute, and the test stopped when failure was first noted, the thickness of coating would

be indicated by ampere minutes, which in this case would be readilly noted since the amperage has been kept constant. In order to insure a uniform rate of solution for all parts of the sample, all parts of the specimen should be equally distant from the cathode. If the shape of the object prevents this, the distance should be made great enough, by using a large vessel, so as to make the variations insignificant. Care must be taken to use a voltage lower than the decomposition voltage of water.

As regards the sherardized coating, the disadvantage of this method would be that the same or greater weight of coating would go into solution per ampere minute as for hot galvanized. As pointed out, this is not the case with the Preece test. However, the test might at times be useful for a laboratory test for the use of the Northern Chemical Engineering Laboratories, or as a check method, without making any effort to bring about its general adoption as a commercial control method.

CAUSTIC SODA TEST

Another test for a zinc coating is the caustic soda test as supplied by Professor Walker. This test will show the presence or absence of pores or cracks in zinc coatings. The galvanized article is suspended by a string or other non-metallic suspension in a strong solution of caustic soda in water, heated to a temperature of 210 deg. F. If pin holes or cracks exist in the surface, bubbles of hydrogen will be observed to come from the surface of the article at these points, while if no pores exist no hydrogen will be evolved.

After considering all the possible methods of testing protective coatings, which is the best method for testing sherardized material? The best one is that which can be successfully used on a commercial scale by a $12 a week apprentice.

(To be continued)

Lake Iron Ore Shipments in July

The iron ore brought down the Lakes from the Lake Superior region in July amounted to 5,784,514 gross tons as compared with 8,204,416 tons in July, 1913. This is a decrease of 2,419,902 tons. The following table gives the July and season shipments by ports and the corresponding figures for 1913, all in gross tons:

	July, 1913	July, 1914	To Aug. 1, 1913	To Aug. 1, 1914
Escanaba	858,696	664,721	2,659,299	1,740,741
Marquette	496,725	297,413	1,556,501	681,361
Ashland	754,329	533,744	2,264,031	1,416,825
Superior	2,396,064	1,956,911	7,073,413	5,690,413
Duluth	1,938,716	1,169,410	5,934,664	2,949,286
Two Harbors..	1,759,886	1,162,315	4,841,552	2,930,004
Total	8,204,416	5,784,514	24,329,460	15,408,630

The decrease in July this year contrasts with the record month of July, 1913, when the 8,000,000-ton mark was passed for the first time. The Duluth percentage to July 1 was 19.14 this year against 24.39 last year, while the Great Northern dock at Superior shipped 35.20 per cent. of the total against 27.65 to July 1, 1913.

The payroll of the West Milwaukee car shops of the Chicago, Milwaukee & St. Paul Railroad has reached 5000 men, or better than 60 per cent. of normal. The entire force is still on a 40-hour-per-week basis, but the outlook is bright for a busy fall. An order for 1300 freight cars, placed last fall, but countermanded temporarily because of the depression, has been renewed and is now being executed.

The Wheeling Traction Company will build a $260,000 power house and generator station at Wheeling, W. Va. J. M. Hopwood is the electrical and consulting engineer.

TRADE COMMISSION BILL

Text of Bill Known as H. R. 15,613, as Passed by the Senate August 5

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a commission is hereby created and established, to be known as the Federal Trade Commission, composed of five members, not more than three of whom shall be members of the same political party, and the said Federal Trade Commission is referred to hereinafter as "the commission." The words defined in this section shall have the following meaning when found in this act, to wit:

"Commerce" means such commerce as Congress has the power to regulate under the constitution.

The term "corporation" or "corporations" shall include joint-stock associations and all other associations having shares of capital or capital stock, organized to carry on business for profit.

"Anti-trust acts" means the act entitled "An act to protect trade and commerce against unlawful restraints and monopolies," approved July 2, 1890; also sections 73 to 77, inclusive, of an act entitled "An act to reduce taxation, to provide revenue for the Government, and for other purposes," of August 27, 1894; and also the act entitled "An act to amend sections 73 and 76 of the act of August 27, 1894, entitled 'An act to reduce taxation, to provide revenue for the Government, and for other purposes,'" approved February 12, 1913.

Sec. 2. Upon the organization of the commission, the Bureau of Corporations, and the offices of commissioner and deputy commissioner of corporations shall cease to exist, and the employees of said bureau shall become employees of the commission in such capacity as it may designate. The commission shall take over all the records, furniture, and equipment of said bureau. All work and proceedings pending before the bureau may be continued by the commission free from the direction or control of the Secretary of Commerce. All appropriations heretofore made for the support and maintenance of the bureau and its work are hereby authorized to be expended by the commission for said purposes.

Any commissioner may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. A vacancy in the commission shall not impair the right of the remaining commissioners to exercise all the powers of the commission.

The commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The terms of office of the commissioners shall be seven years each. The terms of those first appointed by the President shall date from the taking effect of this act, and shall be as follows:

One shall be appointed for a term of three years, one for a term of four years, one for a term of five years, one for a term of six years, and one for a term of seven years; and after said commissioners shall have been so first appointed all appointments, except to fill vacancies, shall be for terms of seven years each. The commission shall elect one of its members chairman for such period as it may determine. The commission shall elect a secretary and may elect an assistant secretary. Said secretary and assistant secretary shall hold their offices or connection with the commission at the pleasure of the commission. Each commissioner shall receive a salary of $10,000 per annum. The secretary of the commission shall receive a salary of $5000 per annum. The assistant secretary shall receive a salary of $4000 per annum. In case of a vacancy in the office of any commissioner during his term, an appointment shall be made by the President, by and with the advice and consent of the Senate, to fill such vacancy, for the unexpired term. The office of the commission shall be in the city of Washington, but the commission may at its pleasure meet and exercise all its powers at any other place, and may authorize one or more of its members to prosecute any investigation, and for the purposes thereof to exercise the powers herein given the commission.

The commission shall have such attorneys, accountants, experts, examiners, special agents, and other employees as may, from time to time, be appropriated for by Congress and shall have authority to audit their bills and fix their compensation. With the exception of the secretary and assistant secretary and one clerk to each of the commissioners, and such attorneys and experts as may be employed, all employees of the commission shall be a part of the classified civil service. The commission shall also have the power to adopt a seal, which shall be judicially noticed, and to rent suitable rooms for the conduct of its work.

All the expenses of the commission, including all necessary expenses for transportation incurred by the commissioners or by their employees under their orders in making any investigation or upon official business in any other place than in the city of Washington, shall be allowed and paid on the presentation of itemized vouchers therefor, approved by the commission.

The Auditor for the State and other departments shall receive and examine all accounts of expenditures of the commission.

Witnesses summoned before the commission shall be paid the same fees and mileage that are paid witnesses in the courts of the United States.

Sec. 3. The commission shall have power among others—

(*a*) To investigate from time to time, and as often as the commission may deem advisable, the organization, business, financial condition, conduct, practices, and management of any corporation engaged in commerce, relating to or in any way affecting the commerce in which such corporation under inquiry is engaged.

(*b*) To require any corporation subject to the provisions of this act which the commission may designate to furnish to the commission from time to time information, statements, and records concerning its organization, business, financial condition, conduct, practices, management, and relation to other corporations, or to individuals, associations, or partnerships, and to require the production for examination of all books, documents, correspondence, contracts, memoranda, or other papers relating to or in any way affecting the commerce in which such corporation under inquiry is engaged, and to make copies of the same.

(*c*) To prescribe as near as may be a uniform system of annual reports from such corporations or classes of corporations subject to the provisions of this act, as the commission may designate, and to fix the time for the filing of such reports, and to require such reports, or any special report, to be made under oath, or otherwise in the discretion of the commission.

(*d*) To make public, in the discretion of the commission, any information obtained by it in the exercise of the powers, authority, and duties conferred upon it by this act, except so far as may be necessary to protect trade processes, names of customers, and such other matters as the commission may deem not to be of public importance, and to make annual and special reports to the Congress and to submit therewith recommendations for additional legislation.

(*e*) In any suit in equity brought by or under the direction of the Attorney General as provided in the anti-trust acts if the court finds for the complainant it may, upon its own motion or the motion of any party to such suit, refer the matter of the form of the decree to be entered to the commission as a master in chancery; whereupon the commission shall proceed in that capacity upon such notice to the parties and upon such hearing as the court may prescribe, and shall as speedily as practicable make report with its findings to the court, which report and findings having been made and filed shall be subject to the judicial procedure established for the consideration and disposition of a master's report and findings in equity cases.

(*f*) Wherever a restraining order or an interlocutory or final decree has heretofore been entered or shall hereafter be entered against any defendant or defendants in any suit brought by the United States to prevent and restrain any violation of the anti-trust acts, the commission shall have power, and it shall be its duty, upon the application of the Attorney General, to make investigation of the manner in which the order or decree has been or is being carried out, and as to whether the same has been or is being violated and what, if any, further order, decree, or relief is advisable. It shall transmit to the Attorney General a report embodying its findings as a result of any such investigations with such recommendations for further action as it may deem advisable, and the report shall be made public in the discretion of the commission.

(*g*) If the commission believes from its inquiries and investigations, instituted upon its own initiative or at the suggeston of the President, the Attorney General, or either House of Congress that any corporation, individual, association, or partnership has violated any law of the United States regulating commerce, it shall report its findings and the evidence in relation thereto to the Attorney General with its recommendations.

For the purpose of prosecuting any investigation or proceeding authorized by this section the commission, or its duly authorized agent or agents, shall at all reasonable times have access to, for the purpose of examination, and the right to copy any documents or writings of any corporation being investigated or proceeded against.

(*h*) The commission is hereby directed to investigate, as expeditiously as may be, trade conditions in foreign countries where associations, combinations, or practices of buyers, dealers, or traders may injuriously affect the export trade of the United States, and to report to Congress thereon from time to time.

Sec. 4. The powers and jurisdiction herein conferred upon the commission shall extend over all trade associations, corporate combinations, and corporations as hereinbefore defined engaged in or affecting commerce, except banks and common carriers.

Sec. 5. That unfair competition in commerce is hereby declared unlawful.

The commission shall have authority to prevent such unfair competition in commerce in the manner following, to wit:

Whenever it shall have reason to believe that any person, partnership, or corporation is violating the provisions of this section it shall issue and serve upon the defendant a complaint stating its charges in that behalf and at the same time a notice of hearing upon a day and at a place therein fixed. The person, partnership, or corporation so complained of shall have the right to appear at the place and time so fixed and show cause why an order should not be entered by the commission requiring such person, partnership, or corporation to cease and desist from the violation of the law so charged in said complaint.

Upon such hearing the commission shall make and file its findings, and if the commission shall find that the person, partnership, or corporation named in the complaint is practising such unfair competition it shall thereupon enter its findings of record and issue and serve upon the offender an order requiring that within a reasonable time to be stated in said order that the offender shall cease and desist from such unfair competition. The commission may at any time set aside, in whole or in part, or modify its findings or order so entered or made. Any suit brought by any such person, partnership, or corporation to annul, suspend, or set aside, in whole or in part, any such order of the commission shall be brought against the commission in a district court of the United States in the judicial district of the residence of the person or of the district in which the principal office or place of business is located and the procedure set forth in the act of Congress making appropriations to supply urgent deficiencies and insufficient appropriations for the fiscal year of 1913 and for other purposes relating to suits brought to suspend or set aside, in whole or in part, an order of the Interstate Commerce Commission shall apply.

Persons, partnerships, or corporations filing or causing to be filed complaints before the commission shall have the right to appear and be made parties to the case and be represented before the courts by counsel, under such regulations as are now permitted in similar circumstances under the rules and practice of equity courts of the United States.

If within the time so fixed in the order of the commission the person, partnership, or corporation against

which the order is made shall not cease and desist from such unfair competition, and if in the meantime such order is not annulled, suspended, or set aside by a court, the commission may bring a suit in equity in a district court in any district wherein such person or persons reside or wherein such corporation has its principal office or place of business to enforce its said order, and jurisdiction is hereby conferred upon said court to hear and determine any such suit and to enforce obedience thereto according to the law and rules applicable to suits in equity. All the provisions of the law relating to appeals and advancement for speedy hearing in suits brought to suspend or set aside an order of the Interstate Commerce Commission shall apply in suits brought under this section: Provided, That no order or finding of the court or commission in the enforcement of this section shall be admissible as evidence in any suit, civil or criminal, brought under the anti-trust acts: Provided further, That neither the orders of the commission nor the judgment of the court to enforce the same shall in any wise relieve or absolve any person or corporation from any liability under the act entitled "An act to protect trade and commerce against unlawful restraints and monopolies," approved July 2, 1890.

Sec. 6. That if any corporation subject to this act shall fail to file any annual or special report, as provided in subdivision (*b*) of section 3 hereof, within the time fixed by the commission for filing the same, and such failure shall continue for 30 days after notice of such default, the corporation shall forfeit to the United States the sum of $100 for each and every day of the continuance of such failure, which forfeiture shall be payable into the Treasury of the United States, and shall be recoverable in a civil suit in the name of the United States brought in the district where the corporation has its principal office or in any district in which it shall do business. It shall be the duty of the various district attorneys, under the direction of the Attorney General of the United States, to prosecute for the recovery of forfeitures. The costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States.

Sec. 7. Any person who shall wilfully destroy, alter, mutilate, or remove out of the jurisdiction of the United States or authorize, assist in, or be privy to the wilful destruction, alteration, mutilation, or removal out of the jurisdiction of the United States of any book, letter, paper, or document containing an entry or memorandum relating to commerce, with the intent to prevent the production thereof, or who shall wilfully make any false entry relating to commerce in any book of accounts or record of any trade association, corporate combination, or corporation, subject to the provisions of this act, or who shall wilfully make or furnish to said commission or to its agent any false statement, return, or record, knowing the same to be false in any material particular, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not exceeding $5000 or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Any employee of the commission who divulges any fact or information which may come to his knowledge during the course of his employment by the commission, except in so far as it has been made public by the commission, or as he may be directed by the commission or by a court, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding $5000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 8. The commission shall have and exercise the powers possessed by the Interstate Commerce Commission to subpoena and compel the attendance and testimony of witnesses and the production of evidence, and to administer oaths. All the powers, requirements, obligations, liabilities and immunities imposed or conferred by the act to regulate commerce, as amended in relation to testimony before the Interstate Commerce Commission, shall apply to witnesses, testimony, and evidence before the commission.

Each corporation having a capital of $5,000,000, to determine which fact the amount of its capital stock, surplus, bonded indebtedness, and undivided profits shall be combined, subject to the provisions of this act shall, within 90 days after the taking effect of this act, designate in writing an agent in the city of Washington, District of Columbia, upon whom service of all notices, orders and processes issued by the commission may be made for and on behalf of said corporation, and file such designation in the office of the commission, which designation may from time to time be changed by like writing similarly filed; and thereupon service of all notices, orders, or processes issued by the commission may be made upon such corporation by leaving a copy thereof with such designated agent at his or its office in the city of Washington with like effect as if made personally upon such corporation, and in default of such designation of such agent service of any notice, order, or other process may be made by posting such notice, order, or process in a conspicuous place in the office of the commission.

All notices, orders, or other process to be served upon individuals or other corporations than those having such capital shall be duly served personally on such individuals and upon the president, chief executive officer, or a director of such other corporations, respectively, unless they shall have designated, as they are hereby authorized to do, an agent as aforesaid with power and authority to accept service of such notices, orders, or other process.

Sec. 9. The district courts of the United States, upon the application of the commission alleging a failure by any corporation, or by any of its officers or employees, or by any witness, to comply with any order of the commission for the furnishing of information, shall have jurisdiction to issue such writs, orders, or other process as may be necessary to enforce any order of the commission and to punish the disobedience thereof.

Sec. 10. The several departments and bureaus of the Government, when directed by the President, shall furnish the commission, upon its request, all records, papers, and information in their possession relating to any trade association, corporate combination, or corporation, subject to any of the provisions of this act.

Sec. 11. Nothing contained in this act shall be construed to prevent or interfere with the enforcement of the provisions of the anti-trust acts or the acts to regulate commerce, nor shall anything contained in the act be construed to alter, modify, or repeal the said anti-trust acts or the acts to regulate commerce or any part or parts thereof.

Metallic Tape Threader

The Lufkin Rule Company, Saginaw, Mich., has brought out a patented measuring tape attachment known as a "threader," which will hereafter be furnished with its metallic woven tapes without extra charge. The threader is a loop and stud arrangement, by means of which the tape, though securely fastened to the winding drum of the case when in use, can yet be readily detached from it and a new tape as readily attached, no manipulation of the case, case screw or drum being required to do this.

Woven tapes are sometimes torn by accident or, through long use, often become soiled and worn in such a way that they must be replaced while the case is yet in very fair condition. The case not receiving the same hard use as the tape line usually outwears it, and representing approximately half the value of the outfit it is of considerable importance that it be a simple matter for anyone to insert a new tape in the old case as often as necessary and thus get the fullest measure of use out of the case as well as the tape. Metallic tapes without cases are quite generally stocked by hardware and supply houses, and can always be easily obtained. The attaching is perfectly and easily accomplished by means of the threader.

At a recent meeting of the stockholders of the Massillon Rolling Mill Company, Massillon, Ohio, the old board of directors was re-elected. R. E. Webb was elected president and W. H. Davey vice-president and general manager.

ESTABLISHED 1855

THE IRON AGE

Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: New England Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

EDITORS

GEO. W. COPE A. I. FINDLEY W. W. MACON

CHARLES S. BAUR, *Advertising Manager*

The Higher Prices for Steel

The action of the steel manufacturers of the country in advancing prices in the first week of a general European war was plainly based on the belief that ultimately the obstruction of European industries will mean a larger demand for American steel products. It probably had in it no expectation that the relation of supply and demand at home would be materially altered in the immediate future. Nor did it mean that the demand for American steel from neutral markets would be immediately a factor in the domestic situation. It was felt that the plunging of all Europe into war involved so many unprecedented conditions that the prudent course for our manufacturers was to be prepared to take advantage of any eventuality. For months producers had been disposing of their product at low prices and their costs had been increased by only partial operation. To keep on selling at these prices would leave the manufacturer without the chance to profit by any enhanced values that might result from throwing the brunt of the world demand for steel upon the United States. The cutting off of shipments of iron and steel from other countries into the United States was not an important factor in the advance, from the tonnage standpoint. It is certain, however, that the ability of consumers at home to import foreign steel products at the lowest prices ever available, due to the reduced duties, has been for months a restraining influence in the home market. For example, the announcement of the price of cotton ties by Pittsburgh manufacturers was much longer delayed than usual this year because of the strenuous efforts of foreign manufacturers to get into this market by promising a price $2 and $3 a ton less than the domestic price, whatever the latter should prove to be. In pig iron, while the price named on the Newfoundland product recently brought in at Eastern ports was not a controlling factor, it had its effect in adding to the demoralization of the Eastern pig iron market. At Gulf ports in the South the offers of foreign bars, particularly bars for concrete reinforcement, were at prices which helped to pull down the domestic market. The actual tonnage of iron and steel imports has not gone greatly over that of corresponding months of last year, but in certain finished products there have been increases. For example, in May the imports of steel rails amounted to 2189 tons against 781 tons in May, 1913, and for the eleven months ending with May this year the steel rail imports were 13,237 tons against 4427 tons. The knowledge that low duties would not be a menace while the war lasted simply added to the hopeful view of home market prospects.

The Pacific coast trade, by the fortunes of war, falls into the hands of steel works at home, just when there has been a disposition to abandon that market to foreign makers. Simply as showing how unexpected factors may be favorable as well as the reverse, that development had its influence in prompting the price advance. It also had weight from the standpoint of new tonnage, for with foreign steel shut off, jobbers and consumers on the Pacific coast must needs lay in stock at Pittsburgh prices plus freight.

The mental effect of such an advance upon consumers who have long found it an advantage to get along on slim stocks is to be counted on in the early stages of new prices, but it is recognized that supply and demand will be decisive in the end. The determining factors are thus the crops, the extent to which the railroads are able to get money at reasonable rates for overdue buying, and the rapidity with which the expected favorable results of the war mature. In all calculations as to the course of steel prices manganese is a factor, not so much, as pointed out elsewhere, through its own advance in price as in the possibility that for lack of it some steel producers cannot make their full product.

The Ferromanganese Situation

An outstanding feature of the ferromanganese market is the fact that the quantity required in the production of a ton of steel is so small that a fancy price can be paid without the cost of steel being advanced sufficiently to discourage consumption. It is computed roughly that $1 on a net ton of finished steel is equivalent to $35 on a ton of manganese ore, the consumption of ferromanganese having averaged, according to the statistics, about 170 pounds of alloy per gross ton of steel ingots produced, while the manganese ores imported during the last dozen years have yielded in ferromanganese about 30 per cent. of their weight.

In recent years the imports of ferromanganese and the domestic consumption have been about on a level. In 1910 there was a very considerable excess of imports over domestic production, while in 1913 the domestic production was correspondingly in excess. Last year's consumption was ap-

proximately 240,000 tons, while the production of steel ingots and castings was 31,300,000 tons. That portion of the Bessemer steel ingots which was made into rails did not involve the use of ferromanganese, spiegeleisen being used as a recarburizer in Bessemer rail steel. In open-hearth rail steel ferromanganese is employed.

Of late there has been an ample supply of domestic spiegeleisen, imports having dropped to negligible proportions, and it is possible to increase this production, while it is possible that relatively low grade ferromanganese, say 30 to 40 per cent. manganese, can be produced from certain domestic ores. One project for such an operation has been on foot for two or three months. Doubtless spiegeleisen and low grade ferromanganese can be used for the production of a considerable tonnage of steel, particularly open-hearth rail steel, for which ferromanganese has hitherto been employed. Spiegeleisen may be used to some extent also by makers of low-carbon open-hearth steel who, to conserve their ferromanganese supply, will run their carbon down a little farther in the furnace and add a mixture of spiegel and ferromanganese.

There are understood to be stocks of ferromanganese in the country sufficient for a run of a small number of months for the steel mills. Apart from these stocks of the alloy, there are stocks of the ore of fair proportions at least. To supplement these stocks, the importation of manganese ore rather than of ferromanganese will have to be forced. The foreign producers of the alloy, being English and German, cannot be counted upon. Within a day of her declaration of war England placed an embargo on the exportation of all metals.

Until the middle of 1912, the two chief sources of manganese ore for the United States were India and Brazil, but in the fiscal year 1913, the latest for which detailed statistics are available, Russia in Asia took second place. Imports of ore from India and Brazil will have to be forced, and with the high price which the steel industry can afford to pay, such imports will be secured rather than that the supply of steel will be cut short. The ultimate consumer of the steel will doubtless pay the expense, but what will be a large matter per ton of manganese ore will be a relatively small matter per ton of finished steel, as suggested at the outset. A consideration of some importance to the smaller steel companies is whether from any increased importation of ores by the Steel Corporation or from any importation independent steel companies having their own blast furnaces may be able to arrange for, these larger companies can make enough ferromanganese to be able to sell any to other users.

The New Banking System Launched

At last the Federal Reserve Board has been completed, the members have been sworn in, and the work of this important addition to our Government financial system can begin. It is expected to be in full operation by October 1. Many months have elapsed since legislation was inaugurated leading to the establishment of reserve banks. The Congressional mills have ground slowly, but their work in this direction has finally been completed. The country is now ready for the demonstration of the practical value of the reserve-bank legislation. One of the opportunities offered to secure direct trade benefits through this new system lies in the authorization of branch banks in foreign countries, and some may be established in countries with which we hope to enlarge our trade. At this time the efforts of our manufacturers and the enterprise of our bankers may go hand in hand to secure the great advantages which are now offered by the interruption of European trade with countries to the south of us. If Congress acts quickly and wisely in the enlargement of our merchant marine, American exports of manufactured goods will show tremendous gains in the coming twelve months.

The War and Our Patent Law

The effects of the European war upon American industries furnish a striking object lesson in connection with the compulsory working of patents, a subject that has been seriously considered from time to time with the idea of introducing the principle into our Federal statutes. Certain materials that enter into manufacturing processes cannot now be obtained outside of Europe. They are not produced in this country. Foreigners hold the patents, and under our laws they are protected here against infringement. The United States insures an inventor freedom from competition. He manufactures the patented article in his own country and sends it over here, and we buy it. On the other hand, the American inventor receives a patent from England or Germany, for example, and is protected only so long as he works the invention on a commercial basis in that country. If he fails to do so the protection is withdrawn, either automatically or upon the petition of some one who wishes to work it himself. If the United States patent law had contained a compulsory working clause some of the materials which are now lacking would be available in the home market.

Dull Times Demand Patience

In times of business depression, with the consequent falling off in receipts, due to fewer orders and more difficult collections and the maintenance of dividend-destroying overhead costs, the dissatisfaction of manufacturers finds expression in many forms. Among these are the overhauling of the personnel of branch office staffs, the curtailing of such outside forces, and the redivision of territories covered by selling representatives. Many of these changes, of course, may have long been latent in the minds of executives and come to an issue in dull times as they are then less likely to be fraught with danger. In fact, in busier times the working out of the necessary details incidental to such changes would be difficult. Again, in times of prosperity the tendency to let well enough alone is common.

The changes referred to are likely, however, to be brought about purely by dissatisfaction with current returns from this or that district, the management being actuated by a desire to see if a change in representation will produce better results. Herein lies a real danger. Unless the

general sales manager and his superiors exercise the best of judgment, and fully take into consideration the impossibility of a salesman making even an average showing when demand is absent, it is not unlikely that they may transfer good men to unfamiliar territory or impose new duties which will inflict injury not only on the man but on the employing company. In some instances, and fortunately they are few, executives are given to writing unfairly sharp and critical letters to selling representatives which embitter them more than spurring them on to greater effort. The time is one when cool judgment and even balance should be maintained in such matters. It was a wise executive, and he was the head of his company, who remarked to a good salesman in his New York office a few weeks ago, "It looks as if we were in for it. Keep on hustling—do your best—but don't worry. We must expect dull times once in a while."

The President's Bereavement

The nation mourns with the President. Death has invaded the White House. It has entered a place associated in our minds with happiness, not sorrow—with pride of power and feasts of adulation, not prostration of grief and agony of desolation. One of the sweetest women on earth has been taken away just when she was doing much good for humanity and in a position to accomplish more. Sharing in the struggles of the young teacher, undoubtedly stimulating him by her ready sympathy in his efforts for advancement, rejoicing when his great ability and scholastic attainments won for him the presidency of a famous university, and living to see him become the First Citizen of the republic, the wife of President Wilson has been permitted to participate but little more than a year in the pleasure of receiving homage from the entire American people. The social duties devolving upon the mistress of the White House were probably too exacting for her frail organization, and just at the time when the nation was beginning to appreciate properly her admirable qualities of mind and heart she succumbed to the ravages of disease. Thus, to the burdens suddenly imposed by the European war President Wilson must bear the additional heart-breaking strain of the loss of the one nearest and dearest to him. At such a time the voice of criticism is dumb. Partisanship, as displayed in heckling the Administration, is stilled. The President, as a human being, stricken with sorrow, needs and receives our deepest sympathy.

Steel Corporation Orders Again Increase

The statement of the unfilled orders on the books of the United States Steel Corporation on July 31 shows them to have been 4,158,589 tons, which is an increase of 125,732 tons over the amount reported for June 30. This increase is the third consecutive one and is the largest of the three. Below is given a statement of unfilled tonnage for each month beginning with the high point of December 31, 1912:

July 31, 1914	4,158,589	September 30, 1913	5,003,785
June 30, 1914	4,032,857	August 31, 1913	5,223,468
May 31, 1914	3,998,160	July 31, 1913	5,399,356
April 30, 1914	4,277,068	June 30, 1913	5,807,317
March 31, 1914	4,653,825	May 31, 1913	6,324,322
February 28, 1914	5,026,440	April 30, 1913	6,978,762
January 31, 1914	4,613,680	March 31, 1913	7,468,956
December 31, 1913	4,282,108	February 28, 1913	7,656,714
November 30, 1913	4,396,347	January 31, 1913	7,827,368
October 31, 1913	4,513,767	December 31, 1912	7,932,164

CORRESPONDENCE

Some Advertising Suggestions

To the Editor: The fundamental idea of advertising, I would say to an advertiser, is to impress on the minds of possible customers who you are, where you are and what you have to dispose of or can do. To get a name thoroughly connected with an article is a great commercial advantage. In fact, it is not uncommon to have a personal name become a noun and every day we will find that people forget the personality; as, for instance, we speak of "babbitt" and think only of a metal instead of Mr. Babbitt himself. Spread on the pages of *The Iron Age* are the names of hundreds of people who put them there to obtain commercial results.

In my own engineering experience I have wondered again and again at advertising displays. While I do not personally know all the machine-tool builders and advertisers of this journal, I do know some, and consequently am able to say to a customer, "Go to the James Smith Company of Sometown for an estimate on your work or to the A. B. C. Company of Someville," knowing that in the first case the equipment is large enough to undertake the work, or, in the second case, that the equipment is small enough to handle the job properly.

A friend is a machine-tool builder. I will call him, so as not to offend him, R. T. James of Jamestown. His advertisement reads and has read for a number of years:

> R. T. JAMES, JAMESTOWN, N. P. PLANERS

I happen to know that the largest size planer he makes will take in 60 in. through the housing. I contend that if he stated this in his advertisement he would save himself needless correspondence and would save other people time. He contends that he wants to get hold of the name and the address of any one who wants, regardless of size, a planer so that he can send his road man to show the good points of his particular style of planer. This from one point of view is probably all right, but what is the use of sending a man to explain the value of a planer, the largest size of which is as mentioned, while the customer is looking for a planer that must take in 108 in.? Possibly a smaller planer will some time be wanted, but the cost of sending a man, under the circumstances, often a considerable distance, does not seem to me good business. I contend that my friend's advertisement should read:

> R. T. JAMES, JAMESTOWN, N. P. PLANERS
> Maximum size made, 60 in. by 60 in., any length of bed.

Laying aside the matter of machine tools, would not this idea work out most advantageously in the advertisements of jobbing shops and manufactories? Here is an actual case very much to the point.

A client had cast in New York some very large pieces which had to be planed. The work was exacting and I could recommend but two places able to do the work and do it properly, both of which were a considerable distance from New York City. One of the firms got the contract for the work. A short time after it had been started I called on a concern that I had known for years and discovered that a few months before it had put in a planer that would have taken in my client's work, and had the company, in its usual display, advertised this fact it would have had a paying job and my client would have been saved time and money.

The concern which put in the new planer is very well known, but, like a great many old and well-known companies, it seems to forget that every day new, fresh blood and brains come into the mechanical world and that to this new lot of business force it is not known as it was to its gray-haired old friends who yesterday washed up for the last time.

Perhaps I am an exception, but I frequently find that proprietors and managers of large works have to

send out into the shop to answer the questions as to the maximum work that can be done therein. Would it not be a great advantage if an advertisement was to read like this?

THE SOUTH IRON WORKS, BROAD RIVER, N. J.

Maximum weight of casting that can be made, 25 tons.
Maximum planer capacity, 144 in. square by 40 ft.
Maximum lathe capacity, 24 ft. by 60 in. face.
Maximum standard lathe capacity, 60 in. by 40 ft.

No business man wants to have his desk cluttered up with useless correspondence. Much of this class of letters could undoubtedly be prevented if advertisers would adopt the idea I have here suggested.

To proceed a little further. In calling attention to advertising displays, some very large concerns give no addresses whatever save the cities in which they have offices. To illustrate how this may work out, a letter addressed to a concern that advertises that it is over a hundred years old, but gives no street address, was returned marked "insufficient address." Usually, the post office is particularly accommodating in supplying the address lacking, but it is not to be wondered at that a letter addressed to a well-known concern with merely the name of the city in which it has its office may be delayed in its delivery or even returned as above cited.

Wanting some paper boxes, I wrote to a concern advertising "all styles and sizes of boxes made," and received the reply that the style of box I wanted it did not make. Now the word "all" in this advertisement is misleading and resulted in loss of time—a certain expense, benefiting no one—which is directly opposite to the fundamental idea in advertising.

In the case of the one advertisement cited there was not enough information, and in the second case there was too much.

W. D. FORBES

NEW LONDON, CONN.

The Value of Small Detail Photographs

To the Editor: It is important to show all small details in the photograph of any machine in order that the operation of the machine may be fully described in advertising literature and in order that every detail will be thoroughly understood by the buyer before the machine is actually bought. Sometimes the photo is changed so much by mistake, by the retoucher, that a machine so built would be inoperable, yet, such photos persist in getting past the chief engineer or advertising manager. To correct an error of this kind is expensive. Sometimes it amounts to the destruction of an entire edition of costly catalogs.

The best plan I know of, for getting all details right, is to take the photograph of the whole machine on a large plate, say, 8 x 10 in., or thereabouts, and make the print. Then note all parts that are so small as to be indistinct or that are indistinct on account of poor lighting and with a small camera take detail pictures of those parts. Such photographs will prove very valuable to the retoucher. They make it needless for him to take chances, and, besides, make the work much easier for him. Small pictures are inexpensive. Small pictures of this kind 2¼ in. square, taken by oneself, cost for film, developing and printing less than 7 cents each. This, of course, does not include the cost of time required for taking the pictures, but they are usually snapshots and the time required is consequently very small.

W. F. SCHAPHORST.

NEW YORK CITY.

Russia's Iron and Steel Output in 1913

Pig-iron output in Russia, according to recent official figures, reached a total of 4,546,607 tons in 1913, as compared with 4,125,882 tons in 1912, an increase of 420,725 tons. The production of steel ingots and puddled bars amounted to 4,827,240 tons in 1913, as against 4,421,285 tons in 1912, the increase of 405,955 tons being practically all in open-hearth steel. An increase of 8.2 per cent. in finished iron and steel is reported for 1913, the total being 3,966,598 tons, against 3,666,708 tons in 1912.

CONTENTS

Narrows Siphon of the Catskill Aqueduct 365
An Improved Punch Press Safety Device 368
The Largest American Diesel Engine 369
Supplymen's View of Rate Decision 369
The Strength of Non-Ferrous Castings 370
The Independent Steel Company Sold 373
New Controllers for Electric Cranes 373
New Cupola Tapping Device 374
Foundry Convention Papers 375
Mistakes in Factory Work 376
Theory and Practice of Sherardizing 378
Lake Iron Ore Shipments in July 381
Trade Commission Bill 381
Metallic Tape Threader 383
The Higher Prices for Steel 384
The Ferromanganese Situation 384
The New Banking System Launched 385
The War and Our Patent Law 385
Dull Times Demand Patience 385
The President's Bereavement 386
Steel Corporation Orders Again Increase 386
Correspondence 386
Russia's Iron and Steel Output in 1913 387
The Trade Commission Bill in Conference 387
The Iron and Metal Markets 388
Pittsburgh and Nearby Districts 400
Spelter Statistics for First Half of 1914 400
Personal 401
C. C. Wormer Machinery Company May Dissolve 401
Articles Contraband of War 402
Legal Aspects of Exports During War 402
Obituary 403
Working to Raise the Embargo on Exports 404
Tin Prices Will Still Tend Upward 408
The Machinery Markets 410
Trade Publications 416

The Trade Commission Bill in Conference

The first measure of the Administration's programme of anti-trust legislation has been finally pushed to approximate completion. After almost two months of debate the Senate has rewritten the House trade commission bill and sent it to conference, where the differences between the Covington bill, as passed by the House, and the Newlands bill which formed the backbone of the Senate consideration will be compromised into a final measure. The Senate amendments appear to have the Administration's support and there is every likelihood that the bill that is to become a law will retain the salient features of the Senate work.

The conferees are Senators Francis G. Newlands, of Nevada; Atlee Pomerene, of Ohio; Willard Saulsbury, of Delaware, Democrats; Albert B. Cummins, of Iowa, and Moses E. Clapp, of Minnesota, Republicans; and Representatives William C. Adamson, of Georgia; J. Harry Covington, of Maryland; Thetus W. Sims, of Tennessee, Democrats; Frederic C. Stevens, of Minnesota, and John J. Esch, of Wisconsin, Republicans. The full text of the bill as passed by the Senate is given elsewhere in this issue. It is expected that at least two weeks will be consumed in preparing the conference report.

The Whitlock Coil Pipe Company, Hartford, Conn., has opened an office at 431 South Dearborn street, Chicago, under the management of Richard S. Bull. His office will handle the sales of all the products of the company for Chicago territory. The line covered will include feed-water heaters, hot-water storage and service heaters, high-pressure pipe bends, flanged joints and iron and steel coils for ice-making and refrigerating apparatus, together with all manner of other coils of iron, steel, brass or copper.

The Iron and Metal Markets

FERROMANGANESE THE KEY

To Steel Production and Prices

Conservative Attitude of the Entire Trade—Various Price Advances

The steel trade is moving cautiously in a situation full of uncertainties. The ultimate benefits war will bring to our manufacturers are producing one set of predictions and prompting one kind of business policy, such as the putting up of prices of steel products. On the other hand are unfavorable effects which figure in the immediate situation—the stopping of exports, the laying off of thousands of men in industries dependent in part on the export trade, the halting of a number of undertakings, the tightening of money and the increase of conservatism in railroad buying.

So far as concerns steel production, considered by itself, the week has shown that if the war is prolonged the country's supply of manganese metals will become an exceedingly important factor. Some steel companies have small stocks and the amount of ferromanganese on the market is limited to a few hundred tons. One of the smaller Ohio steel plants has shut down for lack of the alloy.

The predicted $1 advance in prices was formally made on August 7, when several large companies announced 1.20c., Pittsburgh, as their basis for bars, plates and shapes. At this price deliveries are limited to August and September. For fourth quarter nearly all makers are quoting 1.25c.

There is little evidence that buyers are concerned about building up stocks. The whole consuming trade specified quite liberally in July and there has been light buying at the new prices.

Mill operations have been cut down in a few cases because of the shutting off of foreign trade. The Allentown, Pa., plant of the American Steel & Wire Company, which sends practically all its output abroad, has curtailed production. Some reduction of working force has been made at a New England wire plant also.

In the Chicago district the conservative attitude of the railroads has become more pronounced. There is disappointment over the withdrawal of inquiries for cars by the Southern Pacific and Union Pacific. A trolley line has indefinitely postponed the buying of 2000 tons of rails which have been before the rail mills for some time. The attitude of banks in the past fortnight has caused the laying aside of a number of other plans which involved the buying of steel.

In addition to those in the important tonnage products, an advance has been made in hoops to 1.30c., Pittsburgh, for August and September and to 1.35c. for the fourth quarter, while bands have also gone up $1 a ton or to 1.20c. and 1.25c. respectively for the deliveries named. Shafting has followed the advance in bars and it is probable that higher prices will be named in the near future.

The sheet situation is distinctly firmer and 1.85c. for No. 28 black and 2.85c. for galvanized are now held as minimum by leading producers. A number of sheet mills are running more nearly to full capacity than in many weeks.

Tin plate users have shown some concern about getting deliveries, in view of the possible shortage in tin supply. Tin plate prices have been withdrawn by two or three producers who now name $3.40 per box as their price, subject to prompt acceptance.

Bookings of wire products by the leading producer are reported at 200,000 tons for July, or the largest total it has had in a single month.

Semi-finished steel has shared in the general price movement. Though, as in finished material, there has been little new buying, several Central Western producers now quote $20 at mill for billets and $21 for sheet bars.

The scramble for ferromanganese has shown that the merchant supply was limited to a few hundred tons. A sale of 200 tons of English product was made at $100, as against $38 before the war, and a 100-ton lot was sold at $120. For small lots 5½c. to 6c. a pound is offered. In the East the one merchant producer of spiegeleisen has made considerable sales at $28 for 16 to 19 per cent. manganese metal and $30 for 19 to 21 per cent., as against $23 two weeks ago. A further advance is probable. Several steel companies have been rather eager buyers of spiegel, which will be used to eke out their ferromanganese supply.

All pig iron markets are flat, with indications that foundry operations have been curtailed at some machinery centers.

Our English cable tells of advancing prices in all iron and steel products. Bars, plates and shapes are up about $5 a ton, rails $1.50, tin plates, 20 cents a box, and Cleveland and hematite pig iron 2 shillings and 5 shillings respectively.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month, and one year previous.

	Aug. 12, 1914.	Aug. 5, 1914.	July 8, 1914.	Aug. 13, 1913.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia....	$14.75	$14.75	$14.75	$15.50
No. 2, Valley furnace...	13.00	13.00	13.00	14.00
No. 2 Southern, Cin'ti...	13.25	13.25	13.25	14.00
No. 2, Birmingham, Ala.	10.00	10.00	10.00	10.75
No. 2, furnace, Chicago*	13.75	13.75	13.75	15.00
Basic, del'd, eastern Pa.	14.00	14.00	14.00	15.25
Basic, Valley furnace....	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh....	14.90	14.90	14.90	16.40
Malleable Bess., Ch'go*..	14.00	14.00	14.00	15.00
Gray forge, Pittsburgh..	13.65	13.65	13.65	14.25
L. S. charcoal, Chicago.	15.75	15.75	15.75	14.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

	Aug. 12, 1914.	Aug. 5, 1914.	July 8, 1914.	Aug. 13, 1913.
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh.	**20.00**	19.50	19.00	27.00
O-h. billets, Pittsburgh..	**20.00**	19.50	19.00	27.00
O-h. sheet bars, P'gh...	**21.00**	20.50	20.00	27.50
Forging billets, base, P'gh.	25.00	25.00	25.00	34.00
O-h. billets, Phila.....	**22.40**	21.90	21.90	28.00
Wire rods, Pittsburgh...	24.50	24.50	24.50	28.00
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	12.00	12.00	12.25	14.00
Iron rails, Philadelphia..	14.00	14.00	15.00	17.50
Carwheels, Chicago.....	11.25	11.25	11.25	12.75
Carwheels, Philadelphia..	11.00	11.00	11.00	12.50
Heavy steel scrap, P'gh.	11.50	11.50	11.50	12.50
Heavy steel scrap, Phila.	**10.00**	9.75	10.50	11.50
Heavy steel scrap, Ch'go	9.75	9.75	9.75	10.75
No. 1 cast, Pittsburgh...	11.50	11.50	11.50	12.75
No. 1 cast, Philadelphia.	12.00	12.00	12.00	13.00
No. 1 cast, Ch'go (net ton)	9.50	9.50	9.75	11.00
Finished Iron and Steel,	Cents.	Cents.	Cents.	Cents.
Per Lb. to Large Buyers:				
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	1.17½	1.17½	1.17½	1.42½
Iron bars, Pittsburgh...	1.15	1.15	1.25	1.60
Iron bars, Chicago.....	1.07½	1.07½	1.00	1.45
Steel bars, Pittsburgh..	**1.20**	1.15	1.10	1.40
Steel bars, New York...	**1.36**	1.31	1.26	1.56
Tank plates, Pittsburgh..	**1.20**	1.10	1.10	1.45
Tank plates, New York..	**1.36**	1.26	1.26	1.61
Beams, etc., Pittsburgh..	**1.20**	1.15	1.10	1.45
Beams, etc., New York..	**1.36**	1.26	1.26	1.61
Skelp, grooved steel, P'gh	1.15	1.15	1.15	1.45
Skelp, sheared steel, P'gh	1.20	1.20	1.20	1.50
Steel hoops, Pittsburgh..	**1.25**	1.20	1.25	1.50
Sheets, Nails and Wire,	Cents.	Cents.	Cents.	Cents.
Per Lb. to Large Buyers:				
Sheets, black, No. 28, P'gh	**1.85**	1.80	1.80	2.25
Galv. sheets, No. 28, P'gh	**2.85**	2.75	2.75	3.25
Wire nails, Pittsburgh...	1.55	1.55	1.50	1.65
Cut nails, Pittsburgh....	1.55	1.55	1.55	1.60
Fence wire, base, P'gh...	1.35	1.35	1.30	1.45
Barb wire, galv., P'gh...	1.95	1.95	1.90	2.05
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt..	$1.70	$1.70	$1.75	$2.50
Furnace coke, future....	1.75	1.85	1.85	2.50
Foundry coke, prompt...	2.25	2.25	2.30	2.90
Foundry coke, future....	2.35	2.35	2.40	3.00
Metals,	Cents.	Cents.	Cents.	Cents.
Per Lb. to Large Buyers:				
Lake copper, New York..	12.87½	12.87½	14.00	16.00
Electrolytic copper, N. Y.	12.50	12.50	13.75	15.75
Spelter, St. Louis.....	**5.35**	4.85	4.85	5.50
Spelter, New York.....	**5.50**	5.00	5.00	5.65
Lead, St. Louis.....	3.67½	3.72½	3.75	4.40
Lead, New York.....	3.85	3.90	3.90	4.50
Tin, New York.....	**64.25**	57.00	32.00	41.75
Antimony, Hallett's, N. Y.	**20.00**	8.00	6.75	7.75
Tin plate, 100-lb. box, P'gh	**$3.40**	$3.25	$3.30	$3.60

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.20c. to 1.25c., base, net cash, 30 days.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.20c. to 1.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, $1.35; galvanized, $1.75. Galvanized barb wire and fence staples to jobbers, $1.95; painted, $1.55. Wire nails to jobbers, $1.55. Woven wire fencing, 73½ per cent. off list for carloads; 72½ off for 1000-rod lots, 71½ off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.75	$1.85	$1.95	$2.05
Galvanized	1.95	1.95	2.00	2.05	2.15	2.25	2.65	2.75

Wire Rods.—Bessemer, open-hearth and chain rods, $24.50 to $25.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from April 20, 1914, and iron pipe from June 2, 1913, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	73	52½	⅛ and ¼	66	47
½	77	66½	⅜	65	46
¾ to 3	80	71½	½	69	56
			¾ to 2½	72	61

Lap Weld

2	77	68½	1¼	56	45
2½ to 6	79	70½	1½	67	56
7 to 12	76	65½	2	68	58
13 to 15	53	..	2½ to 4	70	61
			4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted

1 to 3, butt	78	69½	1 to 1½, butt	70	59
2, lap	75	66½	2, butt	70	59
2½ to 6, lap	77	68½	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap	68	59

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	68	57½	⅜	63	52
½	73	66½	½	67	60
¾ to 1½	77	70½	¾ to 1½	71	62
2 to 3	78	71½	2 and 2½	72	63

Lap Weld, extra strong, plain ends

2	74	65½	1½	65	59
2½ to 4	76	67½	2	66	58
4½ to 6	75	66½	2½ to 4	70	61
7 to 8	68	57½	4½ to 6	69	60
9 to 12	63	52½	7 to 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends

½	63	56½	½	57	49
¾ to 1½	66	59½	¾ to 1½	60	52
2 to 2½	68	61½	2 and 2½	62	54

Lap Weld, double extra strong, plain ends

2	64	57½	2	55	49
2½ to 4	66	59½	2½ to 4	60	54
4½ to 6	65	58½	4½ to 6	59	53
7 to 8	58	47½	7 to 8	52	42

To the large jobbing trade an additional 5 and 2½ per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from May 1, 1914, on steel and from January 2, 1914, on iron, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	62	1½ in.	45
2¼ in.	59	1¾ and 2 in.	49
2½ and 2¾ in.	65	2¼ in.	45
3 and 3¼ in.	70	2½ to 2¾ in.	54
3½ to 4½ in.	72	3 and 3¼ in.	57
5 and 6 in.	65	3½ to 4½ in.	60
7 to 13 in.	62	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points. On standard charcoal iron tubes for desirable orders the above discounts are shaded an extra 5, and occasionally two 5's by some makers.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.35 to 1.40
Nos. 9 to 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.60
Nos. 15 and 16	1.60 to 1.70

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.50 to 1.55
No. 12	1.50 to 1.55
Nos. 13 and 14	1.55 to 1.60
Nos. 15 and 16	1.60 to 1.65
Nos. 17 to 21	1.65 to 1.70
Nos. 22 and 24	1.70 to 1.75
Nos. 25 and 26	1.75 to 1.80
No. 27	1.80 to 1.85
No. 28	1.85 to 1.90
No. 29	1.90 to 1.95
No. 30	2.00 to 2.05

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.85 to 1.90
No. 12	1.95 to 2.00
Nos. 13 and 14	1.95 to 2.00
Nos. 15 and 16	2.10 to 2.15
Nos. 17 to 21	2.25 to 2.30
Nos. 22 and 24	2.40 to 2.45
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	3.00 to 3.05
No. 30	3.15 to 3.20

Pittsburgh

PITTSBURGH, PA., August 11, 1914.

The present condition in the steel trade is a forced one, brought about entirely by the European war, and the trade here is still much at sea as to the effect it will have on business. The opinion is general that it should largely increase our foreign trade, especially with South America, as soon as bottoms can be obtained, and this will likely be arranged in the near future. Prices on many lines, except pig iron, coke, scrap and pipe, have been advanced $1 to $2 a ton. These advances are largely predicated on the war lasting for several months, which would no doubt mean a famine in the supply of ferromanganese and the probable shutdown of a number of steel plants. One steel plant in Ohio has already closed down, being entirely out of ferromanganese and not able to obtain any. The local market on plates, shapes and bars is 1.20c., this price being made only for prompt acceptance and quick delivery. The Carnegie Steel Company is quoting 1.25c on plates, shapes and bars for last quarter. All leading steel companies have notified their sales agents to submit offers to the home offices before any orders are accepted. Buyers are up in the air as to what is going to happen, but are quite willing to place orders at present prices if they can get long deliveries.

Pig Iron.—The only movement in the local market in pig iron is in foundry, the Standard Sanitary Mfg. Company having bought 6000 to 8000 tons for last quarter delivery on the basis of about $13, Valley furnace, for No. 2, several sellers holding at $13.50. There is nothing doing in Bessemer, basic or malleable Bessemer, but prices are reported firm. We quote as follows: Bessemer, $14; basic, $13; malleable Bessemer, $13; No. 2 foundry, $13 to $13.50; gray forge, $12.75, all at Valley furnace, with a freight rate of 90c. a ton for Cleveland or Pittsburgh delivery.

Billets and Sheet Bars.—The Carnegie Steel Company, Republic, Youngstown Sheet and Brier Hill have all advanced prices on billets and sheet bars to $20 at mill for Bessemer and open-hearth billets and $21 for Bessemer or open-hearth sheet bars. However, most consumers are covered on contracts and there is little new buying. We now quote Bessemer and open hearth billets at $20, and Bessemer and open-hearth sheet bars at $21, f.o.b. maker's mill, Pittsburgh or Youngstown.

Ferroalloys.—Reports are that 200 tons of English 80 per cent. ferromanganese has been sold at $100 and 100 tons at $120, f.o.b. Pittsburgh, this being re-sale stock and the seller guaranteeing deliveries. One local steel interest that has a fair amount of ferromanganese ahead is fortifying its position as much as possible, and has bought 1500 tons of spiegel at about $28, Pittsburgh. A steel plant in eastern Ohio is reported closed for lack of ferromanganese. As yet there has been no advance in the price of ferrosilicon. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; over 600 tons, $71, delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is $19; 11 per cent., $20, and 12 per cent., $21, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent., spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Muck Bar.—The market is still bare of new inquiry, but in sympathy with other products, prices are firmer. One local maker is quoting $28, an advance of $1 a ton over a week ago. We quote best grades of muck bar, made from all pig iron, at $27.50 to $28, Pittsburgh.

Structural Material.—New inquiries are reported fairly active, but large contracts are slow to close. The Fort Pitt Bridge Works has taken about 3000 tons for steel buildings for the new open-hearth plant of the Youngstown Iron & Steel Company. The Jones & Laughlin Steel Company has taken 750 tons for a steel building for the Loyal Order of Moose in this city, and the American Bridge Company has taken 1350 tons for a highway bridge near Crescent, N. Y., in connection with some barge canal work, and 450 tons for two bridges for the Pennsylvania Railroad in Pittsburgh. The railroad bridge at Sciotoville, reported as having been closed with the American Bridge Company, has not yet been let. The three leading structural steel makers in this district have advanced prices on plain material to the basis of 1.20c. It is stated that no contracts will be accepted at this price, and it is good only for prompt acceptance and on specified work. We now quote beams and channels up to 15-in. at 1.20c., f.o.b. Pittsburgh, and it is likely this price will shortly be advanced at least $1 a ton.

Plates.—Effective August 7, the Carnegie Steel Company advanced its prices on plates to 1.20c. for August and September delivery and is quoting 1.25c. for last quarter. The Jones & Laughlin and Cambria steel companies are quoting 1.20c. on plates for prompt delivery, but will not accept contracts for future shipment at this price. They have notified their sales agents that all inquiries must be submitted to the home office for approval before being closed. The new demand for plates is dull, and the advance in prices is simply the result of a forced situation. No one can tell how soon some of the larger mills may have to close on account of lack of ferromanganese, and the supply of plates might in a short time become scarce. None of the small plate mills is quoting less than 1.20c. and the market seems to be firmly held at that price. The Riter-Conley Mfg. Company has taken some penstock work for the Anaconda Copper Mining Company, requiring about 1500 tons of plates. We now quote ¼-in. and heavier plates at 1.20c. for prompt delivery, with the prospect that several of the larger mills may put their price to 1.25c. within the next week.

Steel Rails.—No large orders for standard sections have lately come out and the new demand for light rails is not so active as some time ago. A number of coal-mining companies and other users of light rails placed contracts in July for delivery over the remainder of this year, but specifications against these are slow. We quote light rails rolled from billets as follows: 25, 30, 35, 40 and 45 lb. sections, 1.10c.; 16 and 20 lb., 1.15c.; 12 and 14 lb., 1.20c., and 8 and 10 lb., 1.25c., in carload lots, f.o.b. Pittsburgh. For large lots these prices might be shaded.

Steel Wheels.—No important orders for forged steel wheels have been placed with the two local makers for some time. In sympathy with other forms of finished steel, prices on carwheels are very firm. We quote 33-in. engine truck forged steel wheels at $22 to $24; 36-in., $23 to $25; 33-in. tender wheels, $18 to $18.50; 36-in. passenger train car and tender wheels, $20 to $20.50, and 33-in. freight car wheels at $15.50 to $16, all f.o.b. Pittsburgh.

Skelp.—While the local market is still quiet as regards new demand, prices are firmer and the minimum on grooved steel skelp is 1.15c., with some makers quoting 1.20c. for prompt delivery. We quote: Grooved steel skelp, 1.15c. to 1.20c.; sheared steel skelp, 1.20c. to 1.25c.; grooved iron skelp, 1.50c. to 1.55c.; sheared iron skelp, 1.60c. to 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Rods.—No new inquiry of moment has come up for some time and only an occasional small lot of rods is being sold for prompt shipment. Mills report that specifications against contracts are coming in at only a fair rate. We continue to quote Bessemer, open-hearth and chain rods at $24.50 to $25, f.o.b. maker's mill, Pittsburgh, but most makers are quoting the higher price.

Iron and Steel Bars.—The new demand is only fair and mostly for small lots, as nearly all consumers of steel bars placed contracts last month for their needs

over this quarter and last half. The leading steel-bar makers now have more contracts on their books than at any time since early in the year, and they report specifications as coming in more freely than for some months. The market is very firm, and the Carnegie, Jones & Laughlin, Cambria and Republic steel companies have advanced prices on steel bars to 1.20c. for prompt acceptance for August and September shipment, while for last quarter 1.25c. has been quoted. Prices on common iron bars are a little stronger, in sympathy with steel. We quote common iron bars, made from scrap and muck bar, at 1.15c. to 1.20c., f.o.b. maker's mill, Pittsburgh. Regular extras for twisting reinforcing steel bars over the base price are as follows: ¾-in. and over, $1; ½ to 11/16-in., $1.50; under ½-in., $2.50 per net ton. These extras are not always observed.

Hoops and Bands.—Effective August 7, the Carnegie Steel Company advanced prices on steel bands to 1.20c. and on steel hoops to 1.30c., these prices being for prompt acceptance for August and September shipment, while for last quarter it is holding bands at 1.25c. and hoops at 1.35c. This advance does not come from increased demand, but from the unusual conditions now existing in the steel trade. We now quote steel bands at 1.20c. for this and next month's shipments, with extras as per the steel bar card, and steel hoops at 1.25c. to 1.30c., the lower price being the absolute minimum and only for prompt acceptance.

Sheets.—The sheet market is somewhat excited over the war situation, and prices have shown a sharp advance. Consumers are trying to cover as far ahead as possible at present prices, but most of the mills are quoting only for prompt shipment, and refusing to enter contracts. Three or four of the leading mills have advanced prices from $2 to $3 a ton, and the absolute minimum on No. 28 black is 1.85c., with most mills holding at 1.90c. The minimum on No. 28 galvanized is 2.85c., with some mills quoting at high as 2.90c. for prompt delivery, and 3c. for delivery within 60 days. The Brier Hill Steel Company is operating its two large sheet mills at Niles, Ohio, full time with orders ahead through September. Other sheet mills are running nearer to full capacity than for some months. Prices on blue annealed are also higher, the minimum of the market being 1.35c. We quote Nos. 9 and 10 blue annealed sheets at 1.35c. to 1.40c.; No. 28 Bessemer black, 1.85c. to 1.90c.; No. 28 galvanized, 2.85 to 2.90c. Prices on black plate for tinning are also higher, and we now quote No. 28, tin mill sizes, H. R. and A., 1.90c.; Nos. 29 and 30, 1.95c. The above prices are for prompt acceptance and for carload lots, f.o.b. Pittsburgh, jobbers charging the usual advances for small lots from store.

Tin Plate.—The tin-plate market is stirred up on account of the famine in supply of tin, which sold on Monday in New York at 75c. per lb. for small lots. Tin-plate makers have practically withdrawn all prices, and $3.40 per base box for tin and terne plate is being named by one or two mills, but for prompt acceptance only. The new demand for pig tin is enormous, coming from all classes of consumers. The American Sheet & Tin Plate Company is being importuned on every hand to sell tin, but is understood to be conserving its resources in its supply to meet the demands of its regular customers. We now quote 100 lb. 14 x 20 coke and terne plates at $3.40 per base box, f.o.b. Pittsburgh, for prompt delivery. Tin-plate makers say they will not enter contracts at this price for forward delivery.

Shafting.—In sympathy with the advance of $2 a ton made within two weeks on prices of steel bars, the market on shafting has advanced and we now quote cold-rolled shafting 65 to 66 per cent. off in carload lots, delivered in base territory. It is said another advance will soon be made. The new demand for shafting is quiet and mostly for small lots, and specifications against contracts are only fair.

Spikes.—New inquiries for spikes for prompt shipment are coming in more freely from the railroads, who probably fear the supply may be materially cut down on account of the unusual conditions existing in the steel business. Prices on spikes have been advanced about $2 per 100 lb., and several of the leading makers state they will accept orders only for prompt shipment at the higher prices. We now quote standard sizes of railroad and boat spikes at $1.45 to $1.50, and small railroad and boat spikes at $1.55 to $1.60 per 100 lb. in carload lots, f.o.b. Pittsburgh.

Merchant Steel.—New inquiries from consumers are better and prices are much stronger. Makers report that specifications are increasing and the whole market is in better shape than for some time. Prices on small lots, which are now stated to be firmly held, are as follows: Iron finished tire, ½ x 1½ in. and larger, 1.30c., base; under ½ x 1½ in., 1.45c.; planished tire, 1.50c.; channel tire, ¾ to ⅞ and 1 in., 1.80c. to 1.90c.; 1⅛ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Wire Products.—As yet the unusual conditions in the steel trade have not affected prices of wire products, but the European war has shut off foreign shipments entirely for the time being. Large inquiries for wire products are coming to local mills from the Pacific coast, this trade having been supplied to some extent by foreign mills. The new demand for wire and wire nails is quiet, as most consumers are covered by contracts made earlier in July and specifications against these are coming in freely. It is said the American Steel & Wire Company booked 200,000 tons of wire products in July, the largest business in any one month in its history. On new orders the market is firm and we quote: Wire nails, $1.55; plain annealed wire, $1.35; galvanized barb wire and fence staples, $1.95; painted barb wire, $1.55, all f.o.b. Pittsburgh, with actual freight added to point of delivery, terms 30 days net, less 2 per cent. off for cash in 10 days. We quote steel cut nails at $1.55 to $1.60, f.o.b. Pittsburgh, in carload lots.

Nuts, Bolts and Rivets.—In sympathy with other lines of finished iron and steel, prices on nuts, bolts and rivets are firmer and rivets have advanced about $1 a ton. Discounts on nuts and bolts have not been changed, but are reported as being firmly held. We now quote buttonhead structural rivets in carload lots at 1.55c. and on small lots, 1.65c.; conehead boiler rivets, 1.65c. in carload lots, and 1.70c. in small lots; terms, 30 days net, 2 per cent. off for cash in 10 days. Discounts on nuts and bolts are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 5% off
Small carriage bolts, cut threads	80% off
Small carriage bolts, rolled threads	80 and 5% off
Large carriage bolts	75 and 5% off
Small machine bolts, cut threads	80 and 5% off
Small machine bolts, rolled threads	80 and 10% off
Large machine bolts	75 and 10% off
Machine bolts, c.p.c. & t nuts, small	80% off
Machine bolts, c.p.c. & t nuts, large	75 and 5% off
Square h.p. nuts, blank and tapped	$6.30 off list
Hexagon nuts	$7.20 off list
C.P.C. and r sq. nuts, blank and tapped	$6.00 off list
Hexagon nuts, ⅝ in. and larger	$7.20 off list
Hexagon nuts, smaller than ½ in.	$7.80 off list
C.P. plain square nuts	$5.50 off list
C.P. plain hexagon nuts	$5.90 off list
Semi-fin. hex. nuts, ½ in. or under	85, 10 & 10% off
Semi-fin. hex. nuts, ⅝ in. and larger	85 & 5% off
Rivets, 7/16 x 6½, smaller & shorter	80, 10 & 5% off
Rivets, tin plated, packages	80, 10 and 5% off
Rivets, metallic tinned, packages	80, 10 and 5% off
Standard cap screws	70, 10 and 10% off
Standard set-screws	75, 10 and 10% off

Standard Pipe.—The National Tube Company reports that it has had no cancellation whatever on foreign orders for standard pipe, but has had suspensions of shipments. These suspensions are expected to be lifted as soon as ships can be obtained to send the material to the other side. The new demand for oil-country goods and casing has fallen off very much, and many orders are held up, as drilling has been stopped. The Mark Mfg. Company has taken 20 miles of 10-in. and 12-in. line pipe for the Ohio Fuel Supply Company. The new demand for standard iron and steel pipe is holding

up well, and is making up to some extent the deficiency caused by the suspension of shipments on foreign orders. Discounts are firmly held, but reports of an early advance in prices of iron and steel pipe are denied.

Boiler Tubes.—Makers report a fairly good demand for locomotive tubes, but merchant tubes are dull. Discounts are still considerably shaded, depending on the order and deliveries wanted.

Old Material.—The tone of prices on all kinds of scrap is firmer, but as yet prices are not actually any higher. Dealers who carry stocks in their own yards are not in a hurry to sell, believing that later on they will get better prices. We note sales of about 2000 tons of selected heavy steel melting scrap at $11.75, delivered to consumer's mill in the Pittsburgh district; also 300 tons of borings at about $8.25, and 600 tons of turnings at about $7.75, delivered. Dealers quote, per gross ton, for delivery to consumers' mills in the Pittsburgh and nearby districts that take the same rates of freight, as follows:

Selected heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.75 to $12.00
Ordinary steel melting scrap	11.50 to 11.75
Compressed side and end sheet scrap	11.00 to 11.25
No. 1 foundry cast	11.50 to 11.75
No. 2 foundry cast	10.25 to 10.50
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	8.25 to 8.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.75 to 13.00
No. 1 railroad malleable stock	11.00 to 11.25
Railroad grate bars	10.25 to 10.50
Low phosphorus melting stock	14.25 to 14.50
Iron car axles	22.50 to 23.00
Steel car axles	15.50 to 16.00
Locomotive axles, steel	20.00 to 20.50
No. 1 busheling scrap	10.25 to 10.50
No. 2 busheling scrap	7.25 to 7.50
Machine shop turnings	7.75 to 8.00
Old carwheels	11.25 to 11.50
Cast-iron borings	8.25 to 8.50
†Sheet bar crop ends	12.00 to 12.25
Old iron rails	13.75 to 14.00
No. 1 railroad wrought scrap	11.50 to 11.75
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	11.25 to 11.50

†Shipping point.

Coke.—There is practically no new demand for blast-furnace coke, but there is fair inquiry for foundry. No trouble is found in getting standard makes of furnace coke for delivery over the remainder of the year at $1.75 per net ton at oven, but several makers are holding at $1.85 to $1.90. Prompt furnace coke can be had at $1.70 or lower. Standard makes of 72-hr. foundry coke are selling at $2.25 for prompt shipment and for delivery over the remainder of the year at $2.35 to $2.40 per net ton at oven. The output of coke in the upper and lower Connellsville regions for the week ended August 1 is given by the Connellsville Courier as 269,579 net tons, an increase over the previous week of 1285 tons.

Chicago

CHICAGO, ILL., August 12, 1914.—(*By Wire*)

Business is moving very cautiously. Caution, in fact, in safeguarding plant operations seems to be responsible for the fair volume of specifications now being sent to the mills. The further advance in steel products to the basis of 1.20c., Pittsburgh, has been generally interpreted as suggesting impending restriction arising out of the war developments. The uncertain prospect for further supplies of ferromanganese is having an important bearing on the market situation, and the possibility of some mill shutdowns is commanding attention. Offers of from 5 to 6c. per lb. for ferromanganese in small quantities have been made in this market. One fact seems assured—we are entering upon a period of higher prices for all commodities. The financial situation here, although easier and practically normal as to currency, still reflects a considerable limitation of credit and rates for money continue high. Developments abroad and action by our own Congress which may operate toward the release of transportation facilities are being watched as matters of foremost concern. Domestic inquiry is declining. The Southern Pacific and Union Pacific railroads have withdrawn their inquiries for cars. It is not a time for new projects. In contrast, an energetic campaign to launch an excursion of local manufacturers into the South American markets has been inaugurated. The prevailing impression in a field of widely divergent opinion seems to be that industry here will profit by reason of the present situation. But, because of a restricted world production more acute and an inevitable curtailment of consumption and world-purchasing power, the ability to finance and extend long credits will have much to do with determining our profits.

Pig Iron.—The pig-iron market shows declining interest. The foundry business in general is moving at a very low rate and melters are covering their requirements in a decidedly conservative manner. There is some inquiry for fourth quarter and sales of small tonnages are reported from day to day. The price situation is unchanged, with Northern foundry and malleable selling on the basis of $14 at furnace for No. 2. For Southern iron $10.25, Birmingham, is still the ruling price, although exceptions are reported, still indicating some transactions on the $10 basis. The furnace capacity in blast in this district, following the blowing out of the Thomas furnace at Milwaukee, is again as low as it has been for some time. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal	$15.75 to $16.75
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	13.75 to 14.25
Northern coke foundry, No. 3	13.50 to 14.00
Southern coke, No. 1 f'dry and 1 soft	14.85 to 15.10
Southern coke, No. 2 f'dry and 2 soft	14.35 to 14.60
Malleable Bessemer	14.00 to 14.25
Standard Bessemer	17.00
Basic	13.25 to 13.50
Low phosphorus	21.00 to 21.75
Jackson Co. and Ky. silvery, 6 per cent.	16.90 to 17.40
Jackson Co. and Ky. silvery, 8 per cent.	17.90 to 18.40
Jackson Co. and Ky. silv'y, 10 per cent.	18.90 to 19.40

(*By Mail*)

Rails and Track Supplies.—The conservative attitude of the railroads seems to have been more pronounced the past week and no business of interest is reported as placed in the West. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts with square nuts, 1.90c. to 2c., base, all in carload lots, Chicago; tie plates, $25.50 to $26, f.o.b. mill net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Lettings continue very light and inquiry for plain material shows a marked falling off. Contracts reported as placed include 400 tons for a University of Illinois building, to the Decatur Bridge Company; 1200 tons for a San Diego & Arizona Railroad viaduct, to the Llewellyn Iron Works; 2920 tons for a bridge at Kansas City, Kan., to the Kansas City Structural Steel Company, the plain material for which will be furnished almost entirely by the Illinois Steel Company. The Great Falls Power Company bought 215 tons of rack frames, and 158 tons for three bridges in Dallas County, Texas, was placed. The leading interest, followed by practically all of the other mills, has advanced the price for prompt shipment $1 a ton to the basis of 1.20c., Pittsburgh, and is increasingly conservative in the acceptance of contracts for forward shipment. In connection with this second advance more tonnage appears to have been placed on the basis of 1.15c., Pittsburgh, and contracts made at 1.10c. are now certain of being specified in full. We quote for Chicago delivery of plain material from mill 1.25c. to 1.28c. on contracts and 1.33c. to 1.38c. for new business.

The store trade continues to show a pleasantly surprising activity. We quote for Chicago delivery of plain material from jobbers stock 1.75c.

Plates.—The withdrawal of inquiry for cars by the Southern Pacific and Union Pacific railroads is very disappointing. It is understood that the financial situation is responsible. Plate mills are again beginning to feel the need of more tonnage, plate specifications

having responded less noticeably to the influence of the advance in price. We quote for Chicago delivery from mill on contract 1.25c. to 1.28c. and for new business 1.33 to 1.38c.

We quote for plates for delivery from stock 1.75c.

Sheets.—For all new business the asking price in this market has been firmly advanced to 1.58c. for blue annealed and to 2.08c. and 3.08c. respectively for black and galvanized sheets. New business and specifications continue to be received at about the same rate and without special indication of influences due to the sharp advance in prices. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.58c.; No. 28 black, 2.08c.; No. 28 galvanized, 3.08c.

We quote for Chicago delivery from store as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.85c.; No. 28 black, 2.35c. to 2.45c.; No. 28 galvanized, 3.35c. to 3.45c.

Bars.—The further advance in the price of steel bars to the basis of 1.38c. has brought out little to show the effect upon the trade, although the steady run of specifications appears to indicate that consumers share something of the uncertainty which is responsible for the higher quotations. Bar iron continues moderately firm at a minimum of 1.07½c., with some business placed at 1.10c. There is very little interest in hard steel bars and prices are unchanged. We quote for mill shipments as follows: Bar iron, 1.07½c. to 1.10c.; soft steel bars, 1.33c. to 1.38c.; hard steel bars, 1.25c. to 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—An effort is being made to establish the price of rivets at 1.60c., Pittsburgh, but in this market 1.68c. can still be done without much trouble. The general upward movement in the steel market has had a tendency to stiffen prices for bolts and screws but no definite advances have appeared. We quote from mill as follows: Carriage bolts up to ⅝ x 6 in., rolled thread, 85-5 to 85; cut thread, 85 to 80-5; larger sizes, 80-5 to 80; machine bolts up to ⅝ x 4 in., rolled thread, 85-10 to 85-5; cut thread, 85-5 to 85; larger sizes, 80-10 to 80-5; coach screws, 85-15 to 85-10; hot pressed nuts, square head, $6.60 off per cwt.; hexagon, $7.60 off per cwt. Structural rivets, ½ to ¼ in., 1.58c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2.20c.; boiler rivets, 2.30c.; machine bolts up to ¾ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ⅝ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square head, $6, and hexagon, $6.70 off per cwt.

Wire Products.—Wire bookings during July ran heavier than was generally appreciated though falling somewhat behind the heavy bookings of June. The outlook for increased exports to South America holds in it special promise of an increased demand for wire and fencing. We quote jobbers as follows: Plain wire, No. 9 and coarser, base, $1.53; wire nails, $1.73; painted barb wire, $1.73; galvanized, $2.13; polished staples, $1.83; galvanized, $2.23, all Chicago.

Cast-Iron Pipe.—Aside from the award of 6000 tons of pipe at Toledo, Ohio, report of which is not yet received, the only inquiry of importance appearing during the week was for 500 tons at St. Paul. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26; 6 to 12 in., $24; 16 in. and up, $23.50, with $1 extra for gas pipe.

Old Material.—At no time during the low-priced periods of the past year or two has there been less buying interest on the part of scrap melters in this market. For lack of inquiry and transactions it is difficult to determine the value of the various scrap materials beyond the fact that the market is generally reached at the prices we quote. Unimportant lists of scrap from the Northern Pacific and Soo Line railroads, together with a blank list from the Lake Shore, constitute the only railroad offerings. We quote, for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 11.75
Old steel rails, less than 3 ft	10.25 to 10.50
Relaying rails, standard section, subject to inspection	22.00 to 23.00
Old carwheels	11.25 to 11.50
Heavy melting steel scrap	9.75 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.00
Shoveling steel	9.25 to 9.50
Steel axle turnings	6.75 to 7.25

Per Net Ton

Iron angles and splice bars	$12.00 to $12.25
Iron arch bars and transoms	12.00 to 12.25
Steel angle bars	8.75 to 9.25
Iron car axles	16.25 to 16.75
Steel car axles	11.75 to 12.25
No. 1 railroad wrought	9.00 to 9.25
No. 2 railroad wrought	8.75 to 9.00
Cut forge	8.50 to 8.75
Steel knuckles and couplers	9.00 to 9.50
Steel springs	9.25 to 9.75
Locomotive tires, smooth	9.50 to 9.75
Machine shop turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
No. 1 busheling	7.50 to 7.75
No. 2 busheling	6.00 to 6.25
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	9.25 to 9.75
No. 1 cast scrap	9.50 to 9.75
Stove plate and light cast scrap	8.75 to 9.00
Grate bars	8.50 to 8.75
Railroad malleable	9.00 to 9.25
Agricultural malleable	8.00 to 8.25
Pipes and flues	6.50 to 6.75

Philadelphia

PHILADELPHIA, PA., August 11, 1914.

Independent manufacturers of plates, bars and shapes have followed with marked unanimity the lead of the large interest in advancing prices to the 1.20c. Pittsburgh base, and the always cheering effect of an upward trend in quotations is in evidence, though up to the present time it has been faith rather than demand that has sustained the spirits of the trade. The higher quotation has brought out a large volume of inquiry from consumers who want to contract on the 1.15c. basis and in some cases to add to contracts which are running at that level. Sellers have taken the stand, however, that they do not wish to enter contracts and that on current business the new price must prevail. There is, nevertheless, an undercurrent of uncertainty in the minds of sellers because of the extent to which the business of many of their customers has been disturbed by the European war. The agricultural implement trade, for instance, cannot tell whether to buy much or little for its future needs, while other examples of manufacturers who are at sea are makers of ice machinery and of sleds, the latter being exported in large quantities to Russia. The pig-iron market has been quiet except that large quantities of low phosphorus have been taken, and prices are unchanged. The ferromanganese situation is more acute, with such small selling as there is on the per lb. basis. Spiegeleisen has been in such demand that some sellers have withdrawn from the market. Billets have advanced. Sheets, for which a good demand has come from the far West where foreign material can no longer be delivered, have been advanced 10c. per 100 lb. Coke and old material are dull, though the latter is stronger. It is not considered that the recent freight rate decision which favored the Middle Western territory only, will have any great effect in augmenting railroad purchasing here. An effect of the foreign situation has been active buying of fluorspar, about 23,700 tons of which came from England in 1913. Though found here, steel makers have been laying in a supply as an insurance against future developments.

Iron Ore.—New business in foreign ore is nil, of course. Imports in the week ended August 8 were good, as follows: From Sweden, 6034 tons; from France, 1476 tons; from Spain, 7850 tons, and from Cuba, 4800 tons.

Pig Iron.—This market has been quiet both as to inquiries and sales, but that it is at least sentimentally stronger is evidenced by the unwillingness of some sellers to accept offers which they would not have

hesitated in accepting a few weeks ago. In foundry irons the few transactions have involved small lots only, but in standard low phosphorus there have been some big sales, several thousand tons having been taken by large steel makers to cover their requirements to the end of the year. On 100 tons of eastern Pennsylvania No. 2 X, wanted by the local navy yard, the two lowest bidders submitted $14.87 and $14.90, delivered on iron running 2.75 to 3.25 per cent. silicon. For 50 tons of No. 2 plain, 2 to 2.50 per cent. silicon, the low bids were $14.62 and $14.75, delivered, quotations which indicate that, while the market is no higher, it is at least no lower, where competitive business is concerned. An eastern Pennsylvania furnace has advanced its price from $14.80 to $15.05, delivered here and definitely states that the new price is its minimum. A Virginia interest has placed about 1400 tons in the week on the basis of $12.50 furnace, or $15.30 to $15.50 Philadelphia, but is selling only its current production at this price. It has an abundant stock which is being held for the higher prices which it is hoped will come in the fall. In basic there has been no life at all. No sales of Southern iron are reported. The following quotations are for standard brands, delivered to buyers' yards in this district:

Eastern Penna. No. 2 X foundry	$14.75 to $15.00
Eastern Penna. No. 2 plain	14.50 to 14.75
Virginia No. 2 X foundry	15.30 to 15.50
Virginia No. 2 plain	15.05 to 15.25
Gray forge	13.75 to 14.00
Basic	14.00
Standard low phosphorus	20.50 to 21.00

Ferroalloys.—No definite quotations on ferromanganese are obtainable except from such dealers as happen to have a few tons on hand, some of which had been reserved for grinding, and they are asking and getting from 5c. to 6c. per lb. for the small lots they are letting go. Now and then an odd lot turns up, which the holder wants to turn into cash at a substantial profit, as in the case of several casks which were consigned to a dealer here. Unfortunately the quantity was not given. A dealer reported to have had a stock of 500 tons a week ago is understood to have disposed of 100 tons since then. In ton lots, $100 to $120 may be quoted, but where found is another matter. The larger steel mills in this district have sufficient to tide them over two months or a little longer, but the smaller consumers, including steel foundries, are not so well fixed. As a result of the shortage of ferromanganese, there has developed a heavy demand for spiegeleisen. It is stated that some of the mills are buying spiegel, not because they have immediate need for it, but because of fear that they may fail to receive deliveries of ferromanganese as they become due on contracts. Spiegel is now quoted at from $28 to $32 per ton according to grade and the percentage of manganese contained, but one or two dealers are holding out for $34.75. In a few cases inquiries for manganese ore has come from steel mills. In 50 per cent. ferrosilicon there has been a little business at full prices. Quotations are unchanged at from $71 for carloads to $73 for large lots. Last week 388 tons of ferromanganese arrived at this port from England.

Bars.—The quotation on spot steel bars is now 1.35c. Philadelphia, based on 1.20c. Pittsburgh, and that this price is subject to withdrawal is pointed out by the mills. The new quotation became effective July 10. Sellers agree that specifications improved in the last week and that consumers were more anxious to contract ahead, but as for the latter sellers are opposed and they are equally unwilling to allow consumers to add to their contracts. Iron bars are in slightly better demand, but the mills are still quoting 1.15c. to 1.17½c., Philadelphia.

Structural Material.—The 1.30c. Philadelphia quotation has been withdrawn and 1.35c. is now asked for current business. Where negotiations were under way at the lower level, it will prevail if the deals are to be closed, but in the case of new propositions 1.30c. already has been declined. Projects now before the trade, on which bids are in, but the business not placed, include a building for the Pennsylvania Railroad at Paoli, Pa., which will require between 300 and 400 tons of shapes and a concrete highway bridge at Baltimore which is in charge of the Maryland State Road Commission and will take over 2000 tons of shapes and bars. Small filling-in orders are no more plentiful than they have been.

Plates.—The good omen seen by the trade is a more general desire on the part of consumers to contract on the basis of 1.15c., Pittsburgh, or 1.30c. here, but such contracts are being made only where circumstances seem to warrant. There has been some buying by railroads, but it was not heavy. Specifications by miscellaneous consumers are better. The shipyard business is poor, but there is some fair bridge plate demand. In current new business 1.35c. Philadelphia is asked.

Billets.—Following the higher quotation at Pittsburgh, $22.40 is quoted here for open-hearth rolling billets, although a higher price is anticipated and some sellers assert that there is no open market, each sale making its own quotation. Forging steel commands $4 to $5 a ton over rolling billets.

Sheets.—Local producers have advanced the price of No. 10 blue annealed sheets from 1.50c. to 1.60c., Philadelphia. The interruption in foreign shipments to the Pacific coast States has caused orders to be diverted here which have been going abroad, local makers thus regaining, at least temporarily, some of the business they had lost. Consumers are coming forward more actively and want to contract on the 1.50c. basis, but that price has been withdrawn.

Coke.—There has been a weaker trend, in the absence of noteworthy demand. Furnace coke ranges from $1.70 to $1.85 per net ton at oven. Foundry coke is quoted at near $2.25 for spot and up to $2.50 for contract, with some special grades running higher. Freight rates to this city from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85 and Mountain, $1.65.

Old Material.—The advance in prices of new steel products has created a better feeling, but the demand from the mills continues very light and is exceeded by that of the sellers themselves, indicating their anxiety to cover contracts. In a few cases prices have advanced. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania, and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$10.00 to $10.50
Old steel rails, rerolling	12.00 to 12.50
Low phosphorus heavy melting steel scrap	14.00 to 14.50
Old steel axles	14.50 to 15.00
Old iron axles (nominal)	20.00 to 21.00
Old iron rails	14.00 to 14.50
Old carwheels	11.00 to 11.50
No. 1 railroad wrought	12.00 to 12.50
Wrought-iron pipe	9.50 to 10.00
No. 1 forge fire	8.00 to 8.50
Bundled sheets	8.00 to 8.50
No. 2 light iron	5.00 to 5.50
No. 2 busheling	8.00 to 8.50
Wrought turnings	8.00 to 8.50
Cast borings	8.50 to 9.00
No. 1 cast	12.00 to 12.50
Grate bars, railroad	8.00 to 8.50
Stove plate	8.25 to 8.75
Railroad malleable	9.00 to 9.50

Cleveland

CLEVELAND, OHIO, August 11, 1914.

Iron Ore.—Considerably more interest has been manifested in the Lake Superior iron ore market in the past few days than at any previous time this year. Inquiries have been received from a number of furnaces by Cleveland sellers, and while no actual sales have been closed the opinion is expressed that the August Lake ore movement will be the heaviest of the season. Whether some of this inquiry has come from Eastern furnaces whose foreign ore supplies have been cut off by the European war troubles has not been disclosed. We quote prices as follows: Old range Bessemer, $3.75; Mesaba Bessemer, $3.50; old range non-Bessemer, $3; Mesaba non-Bessemer, $2.85.

Pig Iron.—Few tonnages of any size have been inquired for in the strictly Cleveland market the past

week, and most sellers of importance have moved little iron in that time. Scattered lots from 50 to 100 tons comprise the most of the sales made here. While the foundry melt shows no change, it is felt by local foundrymen that there is little chance for important improvement in the immediate future. We quote, delivered Cleveland, as follows:

Bessemer	$14.90
Basic	
Northern No. 2 foundry	$13.75 to 13.90
Southern No. 2 foundry	13.75
Gray forge	14.60
Jackson Co. silvery, 8 per cent. silicon	13.25
Standard low phosphorus, Valley furnace	17.55
	20.25

Coke.—Cleveland fuel buyers have not been in the market for round lots for some time and foundry coke users who had not previously covered their requirements are taking small quantities only. We quote strictly standard Connellsville foundry coke for contract at $2.35 to $2.50 per net ton at oven. Furnace coke is quoted at $1.70 to $1.75 at oven for prompt shipment.

Finished Iron and Steel.—Advances announced several days ago by leading Pittsburgh makers of plates, shapes and bars, of $1 a ton, are being adhered to strictly by local sales offices, instructions being to refer to home offices tonnages about which there is any doubt. Makers who had refrained from quoting 1.20c., Pittsburgh, the latter part of last week came to it Monday. Plates had been available up to several days ago in the local market at 1.10c., but today it is a question if 1.15c. can be had even from the same makers. Mills report better bookings on shapes than either of the other two lines, and the recent advance has had the effect of bringing in specifications in good tonnages to all local sales offices. Cleveland contractors are figuring on the steel construction involved in the proposed Hamilton County courthouse, possibly 2700 tons. The Cuyahoga County commissioners have awarded to the Bates & Rogers Company, Chicago, contract for building the Brooklyn-Brighton viaduct in this city, involving 1200 tons of reinforcing bars. This was the contract originally awarded to P. T. McCort, of Akron, who afterward discovered a serious error in his figures. The bar-iron market is dull, almost all local puddling furnaces being closed. An advance in the price of wire products is rumored, and it would not be surprising if such an advance was announced this week. Leading wire fencing makers have opened their books for spring delivery contracts, fully one month ahead of the usual time. Deliveries will be made from now on, but bills will not be presented until next June. Some Valley makers of steel sheets have been booking so steadily the past week that today they are advancing No. 28 black to 1.90c. to 2c., and No. 28 galvanized to 2.90c. to 2.95c., although it is understood the selling base is Youngstown. These prices are only for immediate specifications.

Nuts and Bolts.—Cleveland makers of nuts, bolts and rivets are finding more demand for their products the past few days than in weeks. Inquiries are coming in from agricultural makers in the West, and also from Middle Western users. Prices have not changed but there is an undoubted feeling of firmness which has been notably absent from the nut and bolt market for months. Rivets are quoted at 1.50c. for structural and 1.60c. for boiler, for carload lots. We quote discounts as follows: Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 75 and 15 per cent.; machine bolts with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 80 and 25 per cent.; cut thread, 80 and 20 per cent.; larger or longer, 80 per cent.; coach and lag screws, 80 and 25 per cent.; square h. p. nuts, blank or tapped, $6.30 off; hexagon h. p. nuts, blank or tapped, $7.20 off; c. p. c. and t. square nuts, blank or tapped, $6 off; hexagon, ⅝ in. and larger, $7.20 off; 9/16 in. and smaller, $7.80 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10 and 5 per cent.; 9/16 in. and smaller, 85, 10, 10 and 5 per cent.

Old Material.—Scrap has accumulated to such an extent in the yards of Cleveland dealers the past few weeks that there seems little chance of price changes until at least a portion of the stock has been moved. Steel mills in this city and in the valleys have shown little interest in the scrap market, while rolling mills have not been in the market for some time. All lines of scrap are dull here and quotations in general are unchanged. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Old steel rails, rerolling	$11.50 to $12.00
Old iron rails	13.00 to 13.50
Steel car axles	15.00 to 15.25
Heavy melting steel	10.00 to 10.50
Old carwheels	11.25 to 11.50
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	8.50 to 9.00
Railroad malleable	10.25 to 10.75
Light bundled sheet scrap	7.50 to 8.00

Per Net Ton	
Iron car axles	$17.00 to $17.25
Cast borings	5.75 to 6.00
Iron and steel turnings and drillings	5.25 to 5.50
Steel axle turnings	6.75 to 7.25
No. 1 busheling, new	8.25 to 8.50
No. 1 busheling, old	8.25
No. 1 railroad wrought	9.50 to 10.00
No. 1 cast	10.50 to 10.75
Stove plate	7.50 to 8.00

Buffalo

BUFFALO, N. Y., August 11, 1914.

Pig Iron.—Furnacemen report that shipments on contracts have been heavy the past week, but that very little has been done so far as new business is concerned. The only requests for easing up or suspension on contract shipments are from melters engaged on export work. Current demand from Canada has tapered off to practically nothing, although a revival of this trade is expected later. Prices cover quite a wide range, producers' views being somewhat divergent for the immediate future. Furnaces that booked large tonnages a few weeks ago at relatively low prices, and whose current capacity is provided for, have now stiffened on their quotations, owing to the general uncertainty of the future. Some of the furnaces in this category are asking a minimum of $14 for small orders for No. 2 X and malleable, and even $13.50 for No. 3 foundry and gray forge, though evidently conceding better prices on desirable tonnages. Other producers, who did not fill up their books on low-priced business, and who were piling iron to some extent, are apparently still disposed to accept a less price than the furnaces first mentioned. In fact, quotations of $12.75 to $13 for No. 2 X are reported by one producing interest. The following approximates the ruling schedule of prices as nearly as can be determined, f.o.b. furnace, for last half delivery:

No. 1 foundry	$13.50 to $14.00
No. 2 X foundry	13.00 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	12.75 to 13.25
Malleable	13.25 to 13.75
Basic	14.00
Charcoal, regular brands and analysis	15.75 to 16.75
Charcoal, special brands and analysis	20.50

Finished Iron and Steel.—Mills and agencies are not soliciting forward contracts, selling only for current needs, with bars, plates and shapes ruling at 1.20c., Pittsburgh base, for third quarter, and $1 per ton higher for fourth quarter. Some agencies report very little new business; others, that the demand for current trade is of unexpected volume in many lines. Although many users purchased quite fully for expected requirements prior to the advance in price, others with only small stocks want to cover needs for a reasonable time ahead before any further advance may take place. Some mills are going slow in taking on business, not knowing just what quantity of ferromanganese they can get. The principal local producer in finished materials has a sufficient quantity of ferromanganese to meet its requirements up to January 1. The Lackawanna Steel Company has received an order for 520 tons of steel sheet piling for use at Rotterdam Junction on the Erie Barge Canal, contract No. 19. The Kellogg Structural Steel Company, Buffalo, has the contract for 300 tons of steel for the headhouse of the grain elevator to be erected for the Ralston Purina Company in this city. The Buffalo Structural Steel Company has the contract for steel for a factory addition for the Beaver Company, Buffalo; the Charles F. Ernst Sons Company, Buffalo, has the contract for steel for a factory addition for the Titanium Alloy Mfg. Company, Niagara Falls, both small tonnages, and the Cambria Steel Company for 300 tons for public school No. 26, Rochester. Bids

are soon to be called for by the Buffalo Forge Company for steel required for its new foundry building, about 600 tons.

Old Material.—Although trade is waiting to some extent to get its bearings in relation to the effect an extended war will have, there has been a fairly good general demand, with the exception of cast scrap and malleable, which are inactive. Old carwheels continue to show activity for local use, and turnings and borings have again shown a good tonnage of transactions. There has been no change in prices, except for carwheels, which have advanced slightly. We quote dealers' selling prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$10.25 to $10.50
Low phosphorus steel	14.00 to 14.50
Boiler plate sheared	11.50 to 12.00
No. 1 railroad wrought scrap	10.00 to 10.50
No. 1 railroad and machinery cast	10.50 to 11.00
Old steel axles	12.50 to 13.00
Old iron axles	19.50 to 20.00
Old carwheels	11.00 to 11.50
Railroad malleable	9.25 to 9.75
Machine shop turnings	5.50 to 6.00
Heavy axle turnings	7.50 to 8.25
Clean cast borings	6.00 to 6.50
Old iron rails	13.00 to 13.75
Locomotive grate bars	8.50 to 9.00
Stove plate (net ton)	9.00 to 9.75
Wrought pipe	7.50 to 8.00
Bundled sheet scrap	6.25 to 6.50
No. 1 busheling scrap	8.25 to 8.75
No. 2 busheling scrap	5.75 to 6.25
Bundled tin scrap	10.50

Cincinnati

CINCINNATI, OHIO, August 12, 1914.—(*By Wire.*)

Pig Iron.—There has been some slackening of activity with the jobbing foundries in this vicinity, and as a consequence there is very little buying of any character. A few users of foundry iron in Indiana have sent out requests for prices on lots ranging from 100 to 500 tons, of mixed Southern and Northern grades, but they are evincing no haste to sign contracts. Southern iron is now quoted by several producers at $10, Birmingham, for delivery this year, and it is also stated that orders have been solicited for strictly last quarter shipment at the same figure. Northern furnaces still adhere to former quotations but are doing very little business. It is generally believed that there will be a general adjustment in manufacturing lines by the beginning of the fall season and that the melt of iron will be appreciably increased although there does not now appear to be any tangible basis for this prediction. Melters of basic iron are more alarmed over obtaining a supply of ferromanganese as the stock on hand of practically all users is said to be smaller than has been generally estimated. In the circumstances, they are naturally taking no interest in the pig-iron market, although it is rumored that a few tentative inquiries have been issued as to prices on iron to be shipped the fore part of next year. These have not received serious consideration by iron merchants. Production in the Hanging Rock district of foundry iron is now reduced to one furnace. Some interest is taken in Ohio silvery irons, but no sales of consequence are reported. It is reported here that a shortage of platinum will close many electrical plants. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$13.75 to $14.25
Southern coke, No. 2 f'dry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern No. 4 foundry	12.25 to 12.75
Southern gray forge	11.75 to 12.25
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.45 to 15.95
Southern Ohio coke, No. 2	14.45 to 14.95
Southern Ohio coke, No. 3	14.20 to 14.45
Southern Ohio malleable Bessemer	14.45 to 14.95
Basic, Northern	14.45 to 14.95
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(*By Mail*)

Coke.—A natural slowing up in the demand for foundry coke has taken place, due to slower operations by many manufacturing plants who let out their contracts for castings to jobbing foundries. However, shipments seem to be going forward at a rate that is considered satisfactory by sellers, when conditions are taken into consideration. Domestic coke is being sold at about the usual tonnage rate for this season. Furnace coke is very dull, but other districts make better reports, as it is rumored that special consumers of 48-hr. coke are taking advantage of the situation to lay in small supplies. Connellsville 48-hr. brands are still quoted around $1.70 to $1.90 at oven, the last named figure representing the future maximum contract price. Both Pocahontas and Wise County producers continue asking almost as much for furnace coke as for foundry grades. Leading 48-hr. grades are quoted around $1.85 to $2.10, while foundry coke is obtainable in these two fields at from $2.25 to $2.40 per net ton at oven.

Finished Material.—The uncertainty as to a future supply of ferromanganese has played no small part in advances in all kinds of finished material. However, there has been a slightly better demand for sheets, both black and galvanized, but the improvement to be noted from domestic customers is not very general. There is a great deal of interest taken in the Central and South American markets, that have heretofore been supplied from Europe. At the present writing the price of No. 28 black sheets is 1.90c., Pittsburgh, and galvanized, 2.90c. This would make the market quotations 2.05c. and 3.05c. respectively, f.o.b. cars, Cincinnati, or Newport, Ky. Mill agencies report steel bars as quotable at 1.20c., Pittsburgh, and only for nearby shipment. Local store quotations are unchanged around 1.75c. to 1.80c. on either steel bars or small structural shapes. Hoops and bands are in better demand.

Old Material.—The market is very dull. There is practically no demand from the foundries, and the rolling mills are very slow in closing for a future supply. No change is expected by either buyers or sellers at any early date. The minimum figures given below represent what buyers are willing to pay for delivery in their yards in southern Ohio, and Cincinnati, and the maximum quotations are dealers' quotations, f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$6.75 to $7.25
Old iron rails	11.75 to 12.25
Relaying rails, 50 lb. and up	19.75 to 20.25
Rerolling steel rails	10.75 to 11.25
Melting steel rails	9.25 to 9.75
Old carwheels	10.25 to 10.75

Per Net Ton

No. 1 railroad wrought	$8.75 to $9.25
Cast borings	4.50 to 5.00
Steel turnings	4.50 to 5.25
Railroad cast scrap	9.25 to 9.75
No. 1 machinery cast scrap	10.25 to 11.25
Burnt scrap	6.00 to 6.75
Old iron axles	15.50 to 16.00
Locomotive tires (smooth inside)	9.75 to 10.25
Pipes and flues	6.25 to 6.75
Malleable and steel scrap	7.25 to 7.75
Railroad tank and sheet scrap	5.25 to 5.75

Birmingham

BIRMINGHAM, ALA., August 10, 1914.

Pig Iron.—A feeling of uncertainty dominates the minds of both buyers and sellers of pig iron in this district. The European war seems certainly to have had a most disquieting effect and no one here is willing now to make a prediction as to the immediate outcome regarding its effect on pig iron, although finished materials have been marked up during the week just closed. Some $10 iron was sold the week past for Southern consumption by one maker. Practically all others claim $10.25 as the minimum figure, one interest holding for $10.50 for the remainder of 1914 as its lowest price to its trade in Southern territory. Iron in Tennessee is quoted very generally for prompt or third quarter shipment on a basis of $10, Birmingham, for No. 2 foundry. Sales have been rather light, with no inquiries of consequence pending for the consideration of the trade. Quotations, per ton of 2240 lb., f.o.b. cars Birmingham district furnaces, remain as follows for delivery the remainder of this year:

No. 1 foundry and soft	$10.50 to $11.00
No. 2 foundry and soft	10.00 to 10.50
No. 3 foundry	9.50 to 10.00
No. 4 foundry	9.25 to 9.75
Gray forge	9.00 to 9.50
Basic	10.00 to 10.25
Charcoal	23.50 to 24.00

Cast-Iron Pipe.—Producers of pipe in this immediate territory report a quiet week. It is expected,

however, that the demand for water pipe for shipment to Latin America will soon increase. Some dealers are already feeling the market on material for shipment to South America. With the active operation of the new currency law, and the establishment thereunder of branches of American banks, it is believed a large increase may be soon expected in the cast-iron pipe trade with Latin-American countries. A great deal of pipe of all kinds has been used there in recent years, but the bulk of it has been brought from Germany and Belgium. It is certain that for some time to come no shipments of manufactures can be made from these belligerent countries, and as a consequence Southern producers of water pipe feel much encouraged. Quotations remain as last quoted, namely, $20.50 for 4-in., with 6-in. and larger sizes going at $18.50, all per net ton at foundries here. Gas pipe is easily bringing the premium of $1 per ton over these figures.

Coal and Coke.—Some coal companies have had shipments of bunker fuel to Mobile and Pensacola suspended, due to cancellations of sailings from those ports. On the other hand, some large inquiries are before the market now, looking to the Alabama fields as a probable source of supply in the event the war should continue for many months. Such a contingency would no doubt result in an increased demand at Alabama and Gulf ports for the better grades of coal from this district. The prospect of importations of German and Welsh coke being shut off on the Pacific coast has brought some inquiries from that section for Alabama coke. No actual trades have developed thus far but the inquiry from this source has tended to strengthen what would otherwise have been a rather dull midsummer coke market. Furnace coke is firm at $2.75 to $3 per net ton at the ovens here, while foundry coke is held at $3.50 for quick shipment, with the best grades bringing easily $3.75 on contracts.

Old Material.—Scrap-iron dealers are pinning a good deal of faith to the increase in the asking prices for steel. They feel that this must have some effect on the market for old material. No transactions of consequence have developed, however, and conditions are really far from satisfactory. Quotations remain unchanged as follows, per gross ton, at dealers' yards here:

Old iron axles	$14.50 to $15.00
Old steel axles	14.50 to 15.00
Old iron rails	13.00 to 13.50
No. 1 railroad wrought	10.00 to 11.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	9.00 to 10.00
No. 2 country wrought	8.00 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	8.00 to 8.50
Tram carwheels	9.50 to 10.00
Standard carwheels	10.50 to 11.00
Stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, MO., August 10, 1914.

Pig Iron.—Sales in the past week have been altogether small lots. The widespread purchasing of such lots indicates that melters have use for metal and that they only await settled conditions to begin buying. Ferromanganese continues to be the one especially interesting feature in the market, and holders are refusing to make prices and even to sell under very attractive offers.

Coke.—Carload lots rule the situation in coke at present and, naturally, are going at prices slightly above the market. The 9000-ton inquiry previously reported is still pending, and early purchase now seems rather doubtful. By-product coke is quoted at $5.10 to $5.20, delivered, St. Louis.

Finished Iron and Steel.—The demand has quieted somewhat under the influence of war uncertainties, but prices have been advanced to 1.20c., Pittsburgh, for plates, bars and structural material, with such buyers as have appeared not unduly criticizing the change. All business is in small lots for immediate shipment and urgent needs, but the reports from all sources are of an optimistic character, the general impression seeming to be that there will be marked activity, once the banking situation is placed under complete control. No rail business has appeared, either light or standard, and track fastenings have been in but fair request. The 17,000-ton transaction of the Kansas City Terminal is still pending, with prospects of still further delay.

Old Material.—The market is firm at quoted prices, and business is still at a comparative standstill owing to the general situation. Mills and others report a belief that there will be activity of decided character shortly, and dealers are inclined the same way, and therefore hold prices well in hand. Lists out include 5000 tons from the Southern Railway and 500 tons from the Mobile & Ohio. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton	
Old iron rails	$11.00 to $11.25
Old steel rails rerolling	11.25 to 11.50
Old steel rails, less than 3 ft.	10.50 to 10.75
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	11.00 to 11.25
No. 1 railroad heavy melting steel scrap	10.50 to 10.75
Shoveling steel	8.00 to 8.50
Frogs, switches and guards cut apart	10.50 to 10.75
Bundled sheet scrap	5.00 to 5.25

Per Net Ton	
Iron angle bars	$10.00 to $10.50
Steel angle bars	9.25 to 9.50
Iron car axles	16.75 to 17.25
Steel car axles	11.75 to 12.25
Wrought arch bars and transoms	11.00 to 11.50
No. 1 railroad wrought	8.00 to 8.25
No. 2 railroad wrought	8.00 to 8.25
Railroad springs	9.25 to 9.50
Steel couplers and knuckles	9.25 to 9.50
Locomotive tires, 42 in. and over, smooth	8.75 to 9.25
No. 1 dealers' forge	7.75 to 8.00
Mixed borings	4.00 to 4.25
No. 1 busheling	7.25 to 7.50
No. 1 boilers, cut to sheets and rings	5.75 to 6.25
No. 1 cast scrap	9.50 to 10.00
Stove plate and light cast scrap	8.25 to 8.75
Railroad malleable	8.00 to 8.25
Agricultural malleable	7.50 to 8.00
Pipes and flues	5.75 to 6.25
Railroad sheet and tank scrap	5.75 to 6.00
Railroad grate bars	7.25 to 7.50
Machine shop turnings	5.00 to 5.25

Pacific Coast Buying at Home

Foreign Supply Cut off and Prices Advance to Pittsburgh Basis

(By Wire)

SAN FRANCISCO, CAL., August 10, 1914.

Pacific coast jobbers and fabricators had rather a large tonnage of foreign steel, mostly bars and shapes, under contract for third and fourth quarter shipment. This cannot now be delivered. Stocks in general are light. Not much foreign steel is in stock here now and probably not over 5000 tons is afloat. Its arrival is very uncertain. Buyers accordingly hurried to place contracts with domestic mills covering fall requirements at old prices—mostly bars and shapes, with some plates. More contracts are still coming. The market is strong, with confidence in the firmness of Eastern prices, but the movement is not considered very heavy. Prices in all lines here are up to the present Pittsburgh basis. The Steel Corporation's prices from stock are subject to change.

The Panama Canal opening is a stimulating factor. Freight from New York to San Francisco has been cut to 30 cents on most lines, but a higher rate is expected soon. Pipe business is still light. Some buying in sheets is reported and there are many inquiries but mills are refusing much business at present prices.

The jobbing trade is improving and resale prices are stiffening.

Little foreign pig iron is under contract and not much is afloat. Stocks here are fairly large, with very little demand and prices unchanged.

Trade among the machinery dealers in the Pittsburgh district is reported as extremely quiet, having grown more so since the European war started. Little machinery from the Pittsburgh district is exported, but local business has fallen off a great deal. The only large work in the market is the equipment for the new open-hearth plant of the Youngstown Iron & Steel Company.

New York

NEW YORK, August 12, 1914.

Pig Iron.—The week has brought practically no new inquiry for pig iron apart from carload orders. Some new requests for the withholding of shipments have come from foundries but these are not numerous. In cases where castings enter into machinery for the export trade the cutting off of the outward movement has caused some curtailment of forces which has worked back to the foundry. Under the prevailing conditions prices naturally do not change, though one interest at Buffalo has been quoting $14 lately. As Buffalo iron can be had at $13 for No. 2 X the higher quotations are not bringing business. One New Jersey foundry which inquired for 600 to 800 tons ten days ago has not yet bought. An inquiry for pig iron has come from Japan, the iron wanted evidently being something that cannot be supplied from China. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $14.75 to $15; No. 2 X, $14.35 to $14.60; No. 2 plain, $14.20 to $14.45. Southern iron is quoted at $14.75 to $15 for No. 1 and $14.25 to $14.50 for No. 2.

Ferromanganese and Spiegeleisen.—Neither buyer nor seller of ferromanganese had any faith in the market before the European storm broke, and for the same reason that some users refused to carry stocks merchants now have none to offer. Ferromanganese has sold as high as $115 a ton for 80 per cent. and $125 has been quoted, but the amount available is limited to a few hundreds of tons. In the central West a small amount held by receivers of a steel company brought about three times its cost. Spiegeleisen made by the New Jersey Zinc Company, the only merchant maker in the country, sold at $23 two weeks ago, but in the past ten days has been sold rather freely at $28 for 16 to 19 per cent. manganese content and $30 for 19 to 21 per cent. manganese. Little of the higher manganese percentage is now to be had for this year. A number of open-hearth steel producers, who have never used spiegel before, are now buying it to eke out their ferromanganese by mixing.

Finished Iron and Steel.—Uncertainty dominates the situation. Consumers and sellers are in the dark as to the influence of the war and are conservative in all their movements. Credits are still an important factor in retarding expansion. A normal amount of buying of bars, plates and shapes is reported, or enough to supply immediate needs. Contracting for future delivery is in some lines at a standstill, there being little disposition on the part of producers to bind themselves for the late months of the year and not much inclination on the part of buyers. Export business is naturally stopped. It is generally felt, however, that within 30 days the atmosphere will be clearer and that matters may then assume more definite shape. The withdrawal of all quotations last week and the subsequent advance to 1.20c., Pittsburgh, for plates, shapes and bars, is variously regarded, but this basis is quite general. While there are predictions of a further advance soon, much of the business now moving is reported to be at about 1.15c., with some at the higher level. One producer has had a considerable increase in orders for iron bars and bolts as a result of the advance in prices. It is a little early, however, to gauge the effect of the recent events on the advance in prices or on future business. In structural undertakings scarcely any inquiries are appearing and the market is extremely dull. A few contracts have been closed as follows: The Hay Foundry & Iron Works will furnish 2800 tons for a Y. M. C. A. building in Brooklyn; the Passaic Structural Steel Company, 350 tons for the Crystal apartment on East Seventy-ninth street; the Lackawanna Bridge Company, 200 tons for a power house at Cohoes, N. Y., and Lewis F. Shoemaker & Co., 100 tons for a New Haven Railroad bridge. The Norfolk & Western has awarded a contract for a bridge of 400 tons, presumably to the Virginia Bridge Company. The Goelet loft at Thirty-eighth street and Madison avenue, 2600 tons, has been definitely withdrawn. In new business, bids will go in August 21 on 4600 tons for Section 3, Route 33, of the Broadway and Fourth avenue subway, and on August 20 the New York Central will receive bids for repair work on bridges involving 550 tons. Several bridges for the barge canal are also up for figures. In railroad cars there is no activity, 4600 for the Union Pacific and the 2000 for the Cincinnati, Hamilton & Dayton being still the only large propositions under consideration. We quote mill shipments of steel bars, shapes and plates at 1.15c. to 1.20c., Pittsburgh, or 1.31c. to 1.36c., New York. We quote iron bars at 1.25c. to 1.30c., New York. For lots from store we quote iron and steel bars at 1.80c. to 1.85c., New York, and plates and structural material at 1.85c. to 1.90c.

Cast-Iron Pipe.—Public lettings are fewer, the most important now coming up in this territory being that of Atlantic City, N. J., on which bids will be opened August 14 on 285 tons of 12-in. Private buying, however, is considerably better than usual at this season. Pipe manufacturers report numerous inquiries, which usually lead to actual contracts, but competition is so keen that prices received show little or no profit. Carload lots of 6-in. continue to be quoted at $20.50 to $21, per net ton, tidewater.

Old Material.—While transactions are few, a better feeling prevails, which is based on the increasing business reported by steel manufacturers. It is believed that scrap buying will show considerable improvement in the near future. Prices of steel scrap and rolling-mill stock are a trifle stronger. Dealers' quotations are as follows, per gross ton, New York:

Old girder and T rails for melting	$8.00 to $8.50
Heavy melting steel scrap	8.00 to 8.50
Relaying rails	20.50 to 21.00
Rerolling rails	10.25 to 10.75
Iron car axles	17.25 to 17.75
Steel car axles	11.75 to 12.25
No. 1 railroad wrought	10.25 to 10.75
Wrought-iron track scrap	9.00 to 9.50
No. 1 yard wrought, long	8.50 to 9.00
No. 1 yard wrought, short	8.00 to 8.50
Light iron	3.25 to 3.50
Cast borings	6.00 to 6.25
Wrought turnings	5.50 to 5.75
Wrought pipe	7.50 to 8.00
Carwheels	9.25 to 9.75
No. 1 heavy cast, broken up	10.00 to 10.50
Stove plate	7.50 to 8.00
Locomotive grate bars	6.00 to 6.25
Malleable cast	7.25 to 7.75

Boston

BOSTON, MASS., August 11, 1914.

Old Material.—The trade is highly encouraged by the new conditions that have been created through the influence of the European war. The general bewilderment and the resulting feeling of apprehension which came with the shock of the unforeseen conflict have been replaced by a growing optimism. The dealers believe that a period of prosperous business is about to begin. This is evidenced by the covering of old orders. Local sales have not increased greatly as yet, and prices are unchanged, although they are characterized as much firmer, and expectations of an advance are expressed. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$8.25 to $8.50
Low phosphorus steel	13.75 to 14.75
Old steel axles	13.25 to 13.75
Old iron axles	21.25 to 21.75
Mixed shafting	12.00 to 12.25
No. 1 wrought and soft steel	9.00 to 9.25
Skeleton (bundled)	5.50 to 5.75
Wrought-iron pipe	7.50 to 7.75
Cotton ties (bundled)	6.00 to 6.25
No. 2 light	3.75 to 4.25
Wrought turnings	5.00 to 5.50
Cast borings	5.25 to 5.75
Machinery, cast	11.25 to 11.50
Malleable	8.00 to 8.25
Stove plate	7.75 to 8.00
Grate bars	5.25 to 5.50
Cast-iron carwheels	11.00 to 11.25

The Allis-Chalmers Mfg. Company, Milwaukee, Wis., has started work on an order amounting to $125,000 for motor-driven pumping equipment for the levee pumping station at Memphis, Tenn.

British Prices Much Higher

Continental Steel Shipments Stopped—Home Makers Find Stronger Demand

(By Cable)

LONDON, ENGLAND, August 12, 1914.

The Glasgow pig-iron market reopened last Friday and shows considerable strength, with consumers buying. Cleveland iron has sold at 53s. 3d. ($12.96) cash and 54s. ($13.14) for one month, with good buying. The London market remains closed indefinitely. Very little ore is coming in and the output of hematite threatens to be reduced further. Semi-finished steel is very firm and English sheet-bars are quoted at 110s. to 115s. ($26.76 to $27.98), with nothing available from the Continent. The tone of finished steel is strong and prices have advanced sharply all round. All export business is suspended. Stocks of pig iron in Connal's stores are 87,465 tons, against 83,700 tons two weeks ago. Furnaces in blast are 154, against 199 a year ago. Hematite pig iron is quoted about 64s. ($15.57) but nominal; plates 65s. ($30.41); joists, £6 10s. ($31.62); rails, £6 ($29.20); tin plates, 13s. ($3.16); pig-iron warrants, 53s. ($12.90); maker's iron, 53s. 6d. ($13.02). Everything else is nominal or unquotable.

Metal Market

NEW YORK, August 12, 1914.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Aug.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
5	12.87½	12.50	60.50	3.87½	3.70	5.00	4.85
6	12.87½	12.50	60.50	3.85	3.67½	5.00	4.85
7	12.87½	12.50	61.00	3.85	3.67½	5.10	4.95
8	12.87½	12.50	.....	3.85	3.67½	5.25	5.10
10	12.87½	12.50	64.00	3.85	3.67½	5.35	5.12½
11	12.87½	12.50	64.25	3.85	3.67½	5.50	5.35

Copper is dull at prices which are nominal except for a few small transactions. Tin is scarce and higher, but the market is quieter. Lead is a little more active, but prices are easier. Spelter has advanced sharply because of the prospect of demand from abroad. Antimony quotations are nominal at 18c. to 20c. per lb.

New York

Copper.—There has been some business in copper, but very little, sales of electrolytic having been reported at 12.50c., 12.62½c. and 12.75c., 30 days, delivered. With exports impossible so far as any important quantity is concerned, producers do not appear to be trying to sell, though they are receptive in the matter of bids and will consider them. It is held that any pressure to sell at this time would surely force the market down further. To counterbalance so far as possible the cessation of exports, which amount to about 60 per cent. of this country's production, many of the large smelters have heavily curtailed their output. In Lake various prices are quoted, all the way from 12.50c. to 13.25c., according to brand, but no large business has been done. Custom house returns indicate that 6008 tons have been exported this month, going to England, Holland and France, but some of the earlier shipments included were actually cleared in July.

Tin.—Though the price of tin is higher than it was a week ago and the scarcity greater, there has been somewhat less excitement than prevailed when the gravity of the situation first dawned upon the trade. Conditions became noticeably quieter on August 5, but realization of the short supply caused prices to advance and on that day and the next day there were sales between 60c. and 61c. There was no market for futures from the time it was reported that no more tin would be shipped from England, sellers being unable to guarantee deliveries, while buyers would take no chance on such an uncertainty as was evident. On August 7 there were rumors of a sale of a 5-ton lot at 68c., but the report was not definite enough to be generally accepted. The market continued dull on August 10, but there were small sales at 64c. and 64.25c., with sellers even more cautious because of the uncertainty as to their ability to make good on contracts. On August 11 a special committee appointed by the president of the New York Metal Exchange held a meeting and went over contracts with a view of locating "rings." This had reference to copper, which in paper form was passing from purchaser to purchaser until it reached the original seller again. About 150 tons of such copper was located by the committee and the market was relieved to this extent. Before the meeting there was a sale of tin at 65c., and immediately after the meeting there was one at 64.50c. and the market closed at 64c., with lower bids solicited. When this "ring" metal is absorbed, and of course it is sold most charily, the market will strengthen again. The situation was further relieved by the arrival, August 11, of the Minnetonka with 365 tons, not all of which was subject to contract, while another alleviating circumstance was the arrival of a steamship from Naples with 100 tons which had not been taken into previous calculations. No cases have come to light where consumers were disposed to sell; on the contrary, most of them sought to buy. It has been suggested that if transatlantic trade is not soon resumed direct shipments can be brought from the far East. At the present time more or less tin is received at Pacific ports, those of the month of June amounting to 179 tons. These exports have so far been consumed on the Pacific coast. The total now reported afloat bound for Atlantic ports is 1215 tons, 990 tons of which is on unknown steamers. The New York Metal Exchange continues closed and no cables from abroad are being received.

Lead.—In the latter part of last week the market was dull, but this week it has been more active, though prices are easier. Many of the buyers show a pessimistic tendency and are inclined to hold off for lower prices. If these go below 3.50c., New York, it is expected that the production will be curtailed, as has been the case in previous years. As for the war and its effects on lead, three points are considered, as follows: 1. The supply is ordinarily about equal to the domestic demand. 2. With foreign producers at a standstill, Europe may look here for lead, especially for ammunition. 3. The extent to which the war may adversely affect business here and thereby restrict home consumption. The New York price to-day is 3.85c. and that at St. Louis 3.67½c., a low figure, but one at which metal can be had.

Spelter.—Though there has been no heavy demand at home, good inquiries from Canada and England have caused the market to take a sudden jump, and on August 11 5.50c. New York was made the asking price, with St. Louis correspondingly higher. It is expected that England will come into the market heavily for both spelter and sheet zinc, a good part of the inquiry probably coming by way of Canada. The United States Government spelter statistics for the first six months of 1914 are given elsewhere in this issue.

Antimony.—Quotations for antimony are nominal at 20c. for both Hallett's and Cookson's, and 18c. for Chinese and Hungarian. Consumers of antimony are in much the same position as the users of tin, though most of them are believed to be better supplied. Since the stopping of imports, antimony has been used to a much greater extent as a substitute for tin, and this helped the market to make its radical advance.

Old Metals.—Very little is being done. Dealers' selling prices are about as follows:

	Cents per lb.
Copper, heavy and crucible	12.00 to 12.50
Copper, heavy and wire	11.50 to 12.00
Copper, light and bottoms	10.50 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.75 to 12.00
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	3.70
Lead, tea	3.40
Zinc scrap	3.85

Chicago

AUGUST 10.—No great change has occurred in quotations for copper. With the future supply of tin problematical, prices are steadily rising, and 65c. has been paid. It is possible apparently to purchase in small

quantities only. Spelter quotations also are higher and from St. Louis reports of further advances are being received. In scrap metals the value of tin scrap can only be represented by nominal quotations. We quote as follows: Casting copper, 12.75c. to 13c.; Lake copper, 13.37½c. to 13.50c. for prompt shipment; small lots, ⅛c. to ¼c. higher; pig tin, carloads, 60c.; small lots, 65c.; lead, desilverized, 3.85c., and corroding, 4.10c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.12½c.; Cookson's antimony, 9.50c. for cask lots; other grades, 8c.; sheet zinc, $7, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 11c.; copper bottoms, 9.75c.; copper clips, 10.25c.; red brass, 10.25c.; yellow brass, 7c.; lead pipe, 3.30c.; zinc, 3.50c.; pewter, No. 1, 23c.; tinfoil, 33c.; block tin pipe, 35c.

St. Louis

AUGUST 10.—Most uncertain conditions obtain in the metal markets at this point with prices practically those which the seller is willing to accept and the buyer can be compelled to give, with the exception of lead and copper. Lead, while firmer in sympathy with spelter, is quotable at 3.70c., but spelter is exceptionally strong under both domestic and export demand and sales today jumped rapidly from 5c. to 5.20c., with excellent prospects of 5.50c. by the middle of the week. About 2000 tons were taken to move East preparatory to export at the earliest moment and probably 5000 tons more will move by the end of the week if shipment assurances improve. Tin has jumped to 68c., with a higher figure in sight. Cookson's antimony has advanced in equally sharp manner to 18c. and will probably go higher. Lake copper is nominal at 14c., with electrolytic 13.90c. In the Joplin ore market there was a setback to the market due to uncertainties and as a result the price of zinc ore was $37 to $39, with the choicest lots commanding $42 on settlement. Calamine was fairly active at $20 to $21, with the top settlements at $26. Lead ore was steady at $46. Miscellaneous scrap metals are quoted as follows: Lead, 3c.; zinc, 3c.; tea lead, 3c.; pewter, 20c.; tinfoil, 30c.; light brass, 5c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8.50c.; heavy copper and copper wire, 10c.

No Quotations on Stocks

NEW YORK, August 12, 1914.

All the stock exchanges of the country having been closed since July 30, no quotations on iron and industrial stocks are available. There may have been private transactions in such stocks, but prices obtained in such cases have not been made public. No time for opening the exchanges has yet been fixed.

Dividends Declared

The Niles-Bement-Pond Company, regular quarterly, 1½ per cent. on the preferred stock, payable August 15.

The Pratt & Whitney Company, regular quarterly, 1½ per cent. on the preferred stock, payable August 15.

The Studebaker Corporation, regular quarterly, 1¾ per cent. on the preferred stock, payable September 1.

The American Smelting & Refining Company, regular quarterly, 1¾ per cent. on the preferred stock, payable September 1, and 1 per cent. on the common stock, payable September 15.

Deere & Co., regular quarterly, 1¾ per cent. on the preferred stock, payable September 1.

The General Electric Company, regular quarterly, 2 per cent., payable October 15.

The Inland Steel Company, regular quarterly, 1¾ per cent., payable September 1, and an extra of 25 per cent., payable in stock, September 1.

The Standard Sanitary Mfg. Company, regular quarterly, 1½ per cent. on the common stock, and 1¾ per cent. on the preferred stock, both payable July 28.

Blast furnaces Nos. 4 and 5 at the Ohio works of the Carnegie Steel Company, Youngstown, Ohio, are being relined and will be ready for blast in a short time. Four of the six stacks at this works are in blast.

Pittsburgh and Nearby Districts

The Youngstown Iron & Steel Company, Youngstown, Ohio, has placed contracts for the steel buildings for its new steel plant with the Fort Pitt Bridge Works, Pittsburgh. The open-hearth building will be 130 x 408 ft., but the exact sizes of the pit furnace, manufacturing and gas-producer buildings have not been determined. Other contracts for equipment will shortly be placed. Julian Kennedy, Bessemer Building, Pittsburgh, is the consulting engineer for the erection of this plant.

Among important July shipments made by the Mesta Machine Company, Pittsburgh, were a 44-in. two-high blooming mill, with pinion housings and gear drive, for the Pennsylvania Steel Company, Steelton, Pa., and one of the four large cross-compound blowing engines, equipped with Mesta automatic plate valves of the Iversen patent, for the Cambria Steel Company, Johnstown, Pa.

The report that the Cambria Steel Company of Johnstown, Pa., had purchased the holdings of the Penn Mary Coal Company at Heilwood, Indiana County, Pa., is incorrect. The latter company is owned by the Pennsylvania Steel Company and the property has been put in charge of E. E. Slick, vice-president of the Cambria Steel Company, who is also a director of the Pennsylvania Steel Company. This move no doubt gave rise to the report that it had been bought by the Cambria Steel Company.

The American Flexible Bolt Company, Pittsburgh, has opened offices at 50 Church street, New York City, in charge of R. W. Bennett, general sales manager.

The plant of the Vulcan Iron Works, Inc., at Charleston, W. Va., was recently damaged by fire, with a loss of $30,000. The main part of the plant was burned, including machine and blacksmith shops, foundry and main storage room. The company will likely rebuild at once. Frank Woodman is president.

Operations among the larger manufacturing plants in the Youngstown district this week are at a heavier rate than for some time. The open-hearth plant at the Ohio works of the Carnegie Steel Company is running to about 80 per cent. The Youngstown Iron & Steel Company is operating all its sheet mills. The Youngstown Sheet & Tube Company is operating to from 75 to 80 per cent. The 12-in. bar mill of the Republic Iron & Steel Company, which has been idle more than a month, started up on Monday, and this company is now operating close to 95 per cent. of capacity. The open-hearth plant of the Brier Hill Steel Company is running full, and the company is operating its two sheet mills at Niles, Ohio, to 100 per cent. of capacity, with enough orders ahead to insure this rate of operation through September.

The Ideal Tool & Mfg. Company, Beaver Falls, Pa., advises that the statement that it would receive bids for an addition to its factory on August 1 is incorrect. The plans of the company have not been formulated.

It is said a new steel car plant is to be located near Sharon, Pa., to manufacture steel passenger coaches and street cars. Capitalists of Sharon, New Castle and Pittsburgh are reported as interested in the project, and definite mention of its location will likely be ready shortly.

Spelter Statistics for First Half of 1914

Figures compiled by C. E. Siebenthal, of the United States Geological Survey, from reports by all zinc smelters operating during the first six months of 1914, show that the production of spelter from domestic ore in that period was 171,496 net tons and from foreign ore 3562 net tons, a total production of 175,058 tons, compared with 166,463 tons for the last half of 1913 and 180,213 tons for the first half. The stock of spelter held at smelters June 30, 1914, was 64,039 tons, against 40,659 tons at the beginning of the year and 21,856 tons at the middle of 1913. It is calculated that the apparent consumption for the period covered by the figures was 149,363 tons, which compares with 132,387 tons for the last half of 1913 and 153,073 tons for the first half.

PERSONAL

Chairman E. H. Gary of the United States Steel Corporation heads the committee of Americans organized at Paris last week to facilitate the return to the United States of visitors in Europe. Among others connected with iron and steel companies who were in Europe recently and have not yet returned are William G. Mather, Cleveland-Cliffs Iron Company, Cleveland; Richard Trimble, secretary and treasurer, United States Steel Corporation, New York; Joshua A. Hatfield, president American Bridge Company of New York; B. G. Follansbee, president Follansbee Brothers Company, Follansbee, W. Va.; Ernest Boley, American Steel & Wire Company, Cleveland.

H. M. Merritt, secretary Merritt Mfg. Company, Lockport, N. Y., who went to Europe in November, 1913, and has been there continuously, is among the Americans whose plans for returning home have been disarranged by the war.

Dwight O. Barrett, formerly with the Heer Engine Company, Portsmouth, Iowa, has been made superintendent of the Charles City Engine Company, Charles City, Iowa.

Frederick O. Ball has resigned as general manager of the American Engine & Electric Company, Bound Brook, N. J., and will engage in the manufacture and sale of carburetors with his father, Frank H. Ball. The firm name is Ball & Ball and headquarters will be in Detroit, Mich.

Allen V. Moyer, formerly with the Heine Safety Boiler Company, Phoenixville, Pa., has accepted the position of mechanical engineer with the George T. Ladd Company, Pittsburgh.

Thomas H. Mirkil, Jr., recently resigned as vice-president and general manager of the Poole Engineering & Machine Company, Baltimore, to become resident manager of the Treadwell Engineering Company, Easton, Pa., with office at 1011 Chestnut street, Philadelphia.

Ralph W. Deacon has been appointed superintendent of the U. S. Metals Refining Company, Chrome, N. J. He was formerly metallurgical superintendent of the British American Nickel Corporation, Ltd., Nickelton, Canada.

H. A. Higgins, general manager of the Standard Tool Company, Cleveland, Ohio, who has been touring Europe for the past three months, reached Halifax on the steamer Cedric, August 6.

F. F. Prentiss, vice-president Cleveland Twist Drill Company, Cleveland, Ohio, who has been in Europe for some time, is at present in Naples, Italy.

P. J. Conlin, who has been superintendent of the Dover Furnace of M. A. Hanna & Co., at Canal Dover, Ohio, has been appointed superintendent of the Cherry Valley furnace of the United Iron & Steel Company at Leetonia, Ohio, succeeding B. F. Mullin, who recently resigned.

S. M. Marshall, assistant general manager of A. J. Haws & Sons, Johnstown, Pa., has tendered his resignation, to take effect August 31.

Joseph G. Butler, Jr., returned to Youngstown, Ohio, last week from a six weeks' trip in Europe.

T. W. Siemon, treasurer and assistant secretary of the Westinghouse Electric & Mfg. Company, has resigned those positions as he was recently elected secretary and treasurer, a director and member of the executive committee of the Union Switch & Signal Company, Pittsburgh.

A dispatch from a town in the interior of Siberia received August 4 by officials of the National Association of Manufacturers, New York, stated that David M. Parry, of Indianapolis; John Kirby, Jr., of Dayton, Ohio, and Dr. Albert A. Snowden, of New York, had been stopped on their way to St. Petersburg by the Russian authorities. They were directed to return to Vladivostok, whence they started over the Transsiberian Railway July 29. The three men compose a foreign trade commission which left the United States February 1 and had already investigated trade opportunities in Australia, New Zealand, Japan and China. They will sail from Japan homeward on the steamship Korea, booked to arrive in San Francisco August 21.

F. G. Benson, Benson Brothers, Sydney, Australia, dealers in machinery, largely of American manufacture, is in New York. He is staying at the Hotel Marlborough.

C. C. Wormer Machinery Company May Dissolve

The Union Trust Company, Detroit, Mich., was appointed August 1 temporary receiver of the C. C. Wormer Machinery Company of that city. This was in accordance with a resolution passed by the board of directors July 30, stating that it was deemed beneficial to the stockholders of the company that the corporation be dissolved on account of the extended illness of the president and because none of the directors or principal stockholders is now able to give the company sufficient personal attention to carry on its business. November 10 has been named for the taking of testimony before the commissioner of the Wayne County Circuit Court, and until that time, or until further order of the court, the receiver will carry on the business. The Union Trust Company states that no question of solvency is involved, that the finances of the machinery company are in excellent condition, and that the receiver will make every effort consistent with its duty to guard and maintain the reputation of the house.

The Bethlehem Steel Company has laid off in the past week a number of men who have been employed on construction work, the decision having been made to curtail the construction programme which has been carried on for many months on so large a scale. The number of men affected has been put at 2000. To a greater extent than has been the case at other steel works the Bethlehem Steel Company has been pushing forward new construction in spite of the depression. The unsettled financial conditions due to the war have now suggested the suspension of parts of the new work. There has been no retrenchment in the manufacturing operations of the company.

The Burt Mfg. Company, Akron, Ohio, reports that it did a larger volume of business in July than in any previous month for 22 months. Among its recent orders is one from the Foundation Company, New York, for sixteen 36-in. and four 24-in. metal top and round base ventilators for the plant of the Hooker Electrical Chemical Company, Niagara Falls, N. Y.

The property of the Daniels Machine Company, Woodstock, Vt., was sold at auction August 1. The machine shop, foundry and waterpower were bought by H. M. Stevens, Woodstock, Vt., for $3000 and the machine patents, patterns, name, etc., went to the Mills Machine Company, Lawrence, Mass., at $1200.

The United States Court at St. Paul, Minn., August 12, ordered the dissolution of the International Harvester Company, finding it to be a monopoly in restraint of interstate and foreign trade. The company is capitalized at $140,000,000. The suit for dissolution has been in progress for a long time.

The net surplus of freight cars on the lines of the United States and Canada, on August 1, was 196,665, which represents a decrease of 29,876 cars in the last half of July.

The Meadville Malleable Iron Company, Meadville, Pa., manufacturer of castings, is building an addition to its annealing department. No equipment will be required.

ARTICLES CONTRABAND OF WAR

Many Articles Immune From Capture, Unless Destined for Military Purposes

In 1909, representatives of ten powers entered into what is known as the "agreement of London" in which they defined the rights of commerce in time of war. The nations entering into this agreement were Great Britain, France, Germany, Russia, Austria, Italy, Spain, Japan, Holland and the United States.

They divided commodities into three classes: Absolute contraband, conditional contraband, and free goods, when carried in neutral ships.

ABSOLUTE CONTRABAND

A neutral vessel is liable to capture when more than one-half of its cargo is contraband. The war vessel making the seizure may measure her contraband by value, volume, weight, or the freight rate, and if it can bring the contraband up to more than one-half of the cargo by any of the four methods, it may make a prize of the ship.

Following is the list of absolute contraband, when destined for a place under jurisdiction of the enemy:

Arms of all kinds, including arms for sporting purposes, and their unassembled distinctive parts.

Projectiles, charges and cartridges of all kinds and their unassembled parts.

Powder and explosives specially adapted for use in war.

Gun carriages, caissons, limbers, military wagons, field forges and their unassembled distinctive parts.

Clothing and equipments of a distinctive military character.

All kinds of harness of a distinctive military character.

Saddle, draft and pack animals suitable for use in war.

Articles of camp equipment and their unassembled distinctive parts.

Armor plates, warships and boats, and their unassembled parts specially distinctive as suitable for use only on a vessel of war.

Implements and apparatus made exclusively for the manufacture of munitions of war, for the manufacture or repair of arms or of military material for use on land or sea.

No notice is necessary by a belligerent power to make these articles absolute contraband. A belligerent power under this agreement has the right also to add to the list by proclamation other articles which are susceptible of use in both peace and war. Thus Great Britain has declared absolute contraband aeroplanes, airships, balloons, and air craft of all kinds and their component parts, together with accessories and articles recognizable for use in connection with balloons and air craft.

CONDITIONAL CONTRABAND

Conditional contraband includes articles destined for a place under jurisdiction of the enemy, whose use may be either in peace or in war. If the goods are destined for military use they are subject to confiscation, but if for uses of peace and commerce then they are not contraband.

Conditional contraband is not liable to capture except when on a vessel bound for territory belonging to or occupied by an enemy or for armed forces of the enemy, and when it is not to be discharged at an intervening neutral port. The ship's papers are conclusive proof both as to voyage and port of discharge, unless she is found clearly out of the course indicated and unable to give adequate reasons for deviation.

The agreement states that the following articles, susceptible of use in war as well as for purposes of peace, may without notice be treated as contraband of war, under the name of conditional contraband:

Foodstuffs.

Forage and grain suitable for feeding animals.

Clothing, fabrics for clothing, and boots and shoes suitable for use in war.

Gold and silver in coin or bullion; paper money.

Vehicles of all kinds available for use in war and their component parts.

Vessels, craft and boats of all kinds; floating docks, parts of docks and their component parts.

Railroad material, both fixed and rolling stock, and material for telegraphs, wireless telegraphs, and telephones.

Balloons and flying machines and their component parts, together with accessories and articles recognizable as intended for use in connection with balloons and flying machines.

Fuel; lubricants.

Powder and explosives not specially prepared for use in war.

Barbed wire and implements for placing and cutting same.

Horse shoes and horseshoeing materials.

Harness and saddlery materials.

Field glasses, telescopes, chronometers and all kinds of nautical instruments.

FREE GOODS NEVER CONTRABAND

The agreement expressly declares that "articles and materials which are not susceptible of use in war are not to be declared contraband of war." It further declares the following shall not be declared contraband of war:

Raw cotton, wool, silk, jute, flax, hemp and other raw materials of the textile industries, and also yarns of the same.

Nuts and oil seeds, copra, rubber, resins, gums, lacs, hops, raw hides, horns, bones, ivory, natural and artificial manures, including nitrates and phosphates for agricultural purposes.

Metallic ores, earths, clays, lime, chalk, stone (including marble), bricks, slates and tiles, chinaware and glass. Paper and materials prepared for its manufacture.

Soap, paint and colors, including articles exclusively used in their manufactures; varnishes, bleaching powders, soda ash, caustic soda, salt cake, ammonia, sulphate of ammonia and sulphate of copper.

Agricultural, mining, textile and printing machinery.

Precious stones, semi-precious stones, pearls, mother of pearl and coral. Clocks and watches other than chronometers. Fashion and fancy goods, feathers of all kinds, hairs and bristles. Articles of household furniture and decorations; office furniture and accessories.

Articles serving exclusively for the care of sick and wounded are free. But in case of urgent military necessity they may under certain circumstances be requisitioned, subject to full compensation.

Materials intended for use of the vessels in which found or of the crew or passengers during the voyage are free also.

Legal Aspects of Exports During War.

BY A. L. H. STREET

As has been declared by the United States Supreme Court, this nation when neutral is entitled to trade with belligerents in articles not contraband, in the absence of a blockade. (The Peterhoff, 5 Wall. Reports 28.) But, as evidenced by communications issued by the State Department, it has always been the policy of our government to confine the doctrine of contraband "within the narrowest limits compatible with an honest belligerent policy." (7 Moore's Int. Law Dig. 657.)

One of the latest adjudications on this subject is the decision of the United States District Court for the District of Oregon. (Balfour, Guthrie & Co. vs. Portland & Asiatic Steamship Company,

167 Federal Reporter 1010.) Flour was therein recognized as being contraband if intended for use in equipping an army or navy. The court said in part:

Perhaps a mere declaration by a belligerent nation that articles of commerce are contraband, when by the rules of international law they are not, would not make them so. But here is a proclamation touching provisions that rest upon the border line, and depend for their real character upon the particular state of the port of their destination, whether engaged in civil pursuits only, or in equipping the army or the navy with war supplies. It would seem that, under such conditions, the proclamation of one of the governments at war would be effective to impress the provisions with the character of contraband.

These important elements of the question are to be noted: Goods not adapted or intended for hostile use are not contraband, nor are hostile goods, if destined to a neutral port. But there are several important adjudications to show that a cargo is subject to seizure and condemnation if nominally destined for a neutral port, but actually intended to merely touch that port and then proceed to a blockaded port. (7 Moore's Int. Law, 697 et seq.) Further, "the carriage of contraband goods does not subject the vessel and remaining cargo to confiscation, unless they all belong to the same owner, or unless there has been some actual co-operation in an attempted fraud upon the belligerent," but "contraband articles contaminate the non-contraband parts of a cargo, if belonging to the same owner." (7 Moore's Int. Law, 745, 746.)

VALIDITY OF TRANSPORTATION CONTRACTS

That a contract made in this country to transport articles to a country at war is valid, although they be contraband, was declared by the Supreme Court in the case of Northern Pacific Railway Company vs. American Trading Company (195 U. S. Reports 465), wherein it was held that a contract to carry a shipment of lead from Newark to Yokohama was valid, although it was intended for use by the Japanese in an existing war with China.

In the Balfour, Guthrie & Co. case above mentioned the United States District Court, following the decision of the Supreme Court, decided that such a contract is not invalid, although the goods be subject to seizure and condemnation by the enemy of the country to which they are consigned. The court admits that this "proposition may seem anomalous," but insists that "it appears to be sound nevertheless." So it was decided that the steamship company was not released from its contract to carry a cargo of flour to Japanese ports by reason of the fact that Russia had declared foodstuffs to be contraband and had declared a blockade on Japanese ports, especially if the blockade had not been made effective. But the following extract from the decision of the United States District Court for the Southern District of New York, in the case of the Spartan (25 Federal Reporter 44), shows that failure to deliver a cargo may be excused by existence of a blockade:

In case of a blockade of the port of destination, especially where, as in this case, the very place of discharge is subject to the major force of the blockading squadron, and in the absence of any alternative provisions in the charter, the English and American authorities apparently sustain the contention that the obligations of the charter party, as a strict common-law contract, are dissolved . . . If this major force were temporary only, the effect would be only a suspension of the obligations of the contract till this superior force were withdrawn; as in the case of an embargo of the port of departure, where the vessel as it is held, may retain the cargo unless perishable, till the embargo is removed, and then complete her voyage and earn the stipulated freight. But by the English and American law a blockade of the port of destination is regarded as a permanent obstacle to the completion of the contract on either side. This distinction between the effects of an embargo and of a blockade is well settled in the English and American law, though not in accord with the provisions of the majority of the continental codes on the same subject. The effect of such a blockade under our law is, therefore, to relieve each party from the obligation to deliver the cargo, or to receive it at the specific place designated in the charter, without any liability for damages by either to the other; and this, in substance and effect, is a dissolution of the specific contract as a common-law obligation.

OBITUARY

The death of WILLIAM H. ANDERSON, president W. H. Anderson Tool & Supply Company, Detroit, Mich., which occurred July 28, was briefly referred to in last week's issue of *The Iron Age*. He was born in Edinburgh, Scotland, April 23, 1837. Serving an apprenticeship in one of the largest shops in that city, he then came to this country, where his two older brothers had preceded him. After several years spent in towns along the St. Lawrence River, he arrived at Detroit in 1861, where he became master smith in the engineers' department under General Cramm, who was then erecting Fort Wayne. Leaving Government employ, he worked for a time in Pittsburgh, returning to Detroit in 1871, where he started in business for himself, specializing in the manufacture of tools for working stone, marble and granite. In 1882 his oldest son, James D., was admitted to partnership and later the firm was incorporated and a second son, William R., became identified with it. The activities of the company were then extended to include tools used in cement working and in telephone and railroad construction and to the manufacture of special iron work used in building and machine construction. The company afterward added a contractors' jobbing supply house which is now claimed to be the largest of its kind in Michigan. He leaves a widow, three sons and one daughter. Owing to his advanced age, he had not recently been active in the management of the company and no change will be made in its policy as conducted in the past five years.

WALTER P. WARREN, Troy, N. Y., died August 8, aged 73 years. He had been from early manhood connected with the stove industry and, at the time of his death, was president of the Fuller & Warren Company, Troy, and was identified with a number of other business enterprises. He was an active member of the National Association of Stove Manufacturers and took a deep interest in its welfare, with the result that he was elected president at the convention held in Chicago in May, 1905, serving one year. In 1864 he was appointed colonel on the staff of Governor Hoffman of New York, serving four years.

DONALD M. PHILBIN, formerly manager of the Lake Superior iron ore properties of the Great Northern Railroad, died at his home in Duluth, Minn., August 6, aged 58 years. He was also formerly general manager of the Duluth, Missabe & Northern Railroad and superintendent of the Duluth & Winnipeg Railroad, now a part of the Great Northern system.

The Bridge Builders & Structural Society, 50 Church street, New York, reports that at the monthly meeting of the society, held in New York, August 7, it was shown from careful reports collected by the secretary that during the month of July 68 per cent. of the entire capacity of the bridge and structural shops of the country was contracted for.

Rogers, Brown & Co., pig-iron merchants, have issued a colored war map of Europe, which they are distributing with their compliments. It is on a sufficiently large scale for the general reader, with Austria-Hungary and the Balkan countries separately given on a still larger scale.

Working to Raise the Embargo on Exports

Business Interests Urge Government Insurance of War Risks—Manufacturers Moving for South American Trade—Methods to Be Adopted

The second week of Europe's war has brought the first light on some of the problems American manufacturers and financiers must solve. Chief of these are the blockade of the international money market and the cutting off of shipping facilities. At a meeting in New York, August 10, presided over by President Farrell, of the United States Steel Corporation, action was taken urging the United States Government to provide war risk insurance for American vessels engaged in oversea trade. It is pointed out that the British Government insurance provided for last week covers only British vessels and cargoes. A committee will hold a conference with Secretary McAdoo at Washington on Friday.

In a communication below Charles M. Muchnic, manager of the foreign department of the American Locomotive Company, points out that there is much more involved in getting South American trade than is taken account of in some too easy optimism now afloat, that has all but assumed that the South American trade which has heretofore gone to Europe is already ours.

At Chicago the Foreign Commerce Bureau of the Association of Commerce is taking definite steps to bring manufacturers in various lines in communication with South American buyers. The association is working through its own representative in Buenos Aires.

The Situation at New York

A week after the war was on in earnest most New York exporters and importers were but little wiser as to the state of their foreign business than at its beginning. In many cases they had received no replies to cable messages even where these were sent to England, while communication with Germany has been entirely out of the question since August 3. Throughout the iron and steel trade there was, however, a more sanguine feeling because of the belief held very generally that only a short time would elapse before trade with Great Britain and France would become safer, at least so far as the Atlantic is concerned. It is commonly held, nevertheless that some weeks must elapse, even after the high seas are safe, before trade between the United States and England and France and some of the neutral countries will be on an approximately normal footing, because of the situation in foreign exchange, uncertainty as to credits, the difficulty of chartering ships and the high marine insurance rates.

STEP TO OPEN CLEARING HOUSE FOR CREDITS

In the direction of lessening the restrictions which the lack of exchange facilities has imposed on foreign trade the National City Bank on August 7 issued the following statement:

> The National City Bank is taking measures to assist exporters and importers in their trade operations which have been impeded owing to the serious derangement of the foreign exchange mechanism. It has conceived a plan of acting as a clearing house for bank and cash credits and for debits of those doing business in South America and in such other parts of the world as developments may make it appear necessary and feasible.
>
> The European situation has made it necessary to put in force in many parts of the world moratoria and bank holidays, and this makes it temporarily impossible to perform regular trade functions through the medium of normal foreign exchange mechanism. It is, however, possible, and it will undoubtedly be of great help to clear debits and credits upon foreign points in this way. This necessitates the bringing together of all business interests who have either debits or credits at these points. The National City Bank is desirous of helping the foreign trade situation as much as possible and invites the co-operation of all those who are interested in facilitating and building up our foreign commerce.

It has been suggested, with regard to possibilities of American trade in southern and southeastern Europe, that borrowers in those districts will be compelled to turn to the United States and they naturally will do their purchasing in the country in which they get their money.

IMPORTERS OF TOOL STEEL NOT WORRIED

Investigation among importers of tool steels and the representatives of foreign manufacturers of such steel showed little or no apprehension as a result of the war. Some of them, in fact, rather welcomed the possibility of a chance to reduce their stocks. Up to the present time they had seen no occasion to advance prices, despite the fact that shipments to this country had been held up, although several dealers say this contingency might come in the case of high-speed steel the value of which is so great that large stocks are not ordinarily carried. They explain further that while American manufacturers could take care of the demand for ordinary carbon steel, their manufacture of high-speed steel might be limited because of the scarcity of ferrotungsten, most of which is imported. On the other hand the total quantity of high-speed steel used is not large, the supply coming from England, Germany, Austria and France.

A company handling Swedish tool steel exclusively has on hand a very large stock and can easily take care of its customers for some months to come. Another company dealing in both English and Swedish steel has a large stock and on August 8 received a cable from Sweden that a shipment of 237 tons of tool and drill steel was about to sail on a Danish steamer direct to this country. This company anticipated no trouble unless the war should spread to other countries and this was not considered likely. Should any shortage in ordinary sizes develop, most of the companies have large sized stock which can be hammered or rolled to the desired dimensions. Some customers have been arranging for a supply of their favorite brands to guard against a possible shortage.

In one case a shipment of Swedish steel left Sweden, bound for this country via Hamburg. Where this material is now is purely a matter of conjecture. Fifty tons of drill steel destined for South Africa is still lying on a New York dock. The Becker Steel Company of America states that the war will not interfere with its going ahead with plans for manufacturing tool steel at the plant of the Baldwin Steel Works, Charleston, W. Va.

In the first week of the disturbed conditions the price of Swedish iron made two advances, first going up 25c. per 100 lb. and then 15c. per 100 lb., and it is predicted that there will be another of 25c. in the course of a few days.

Government Insurance of War Risks Urged

The National Foreign Trade Council, which was created by the National Foreign Trade Convention in May and of which James A. Farrell, president United States Steel Corporation, is chairman, held a meeting at the New York Chamber of Commerce August 10 to consider measures for the relief of the congestion of foreign commerce. The council consists of 35 manufacturers, bankers, merchants, railroad and steamship men. Mr. Farrell opened the meeting with a brief statement in which he said: "Even if we could sell steel for $1000 a ton and wheat for $10 a bushel it would profit us little while we are without means of safe transportation."

The following committee was appointed to recommend action on the part of the council: James J. Hill, St. Paul; E. A. S. Clarke, president Lackawanna Steel Company; E. P. Thomas, president United States Steel Products Company; P. A. S. Franklin, vice-president International Mercantile Marine; A. H. Mulliken, vice-president Chamber of Commerce of the United States of America; J. A. G. Carson, vice-president Savannah (Ga.) Board of Trade; E. N. Hurley, vice-president Illinois Manufacturers' Association; Barton Myers, president Norfolk (Va.) Chamber of Commerce; Welding Ring; Willard Straight, president American Asiatic Association.

The committee submitted resolutions which were adopted, urging the Federal Government to provide promptly at reasonable rates war risk insurance on both the hulls and cargoes of American vessels engaged in oversea trade, Congress being urged to lose no time in the enactment of the necessary laws; also pledging the co-operation of the council in helping American bankers to restore and maintain stable foreign exchange. The resolutions were forwarded to President Wilson and other administration officials and to leading members of the House of Representatives.

Mr. Hill, Mr. Farrell and others expressed the opinion that even with upwards of 100 foreign built ships ready to come under the American flag the present rates of insurance were so high that registry would be retarded. The council will be represented at a conference with Secretary of the Treasury McAdoo August 14. The following committee of five was appointed to meet daily in New York, keep in communication with all the members and take action as necessity arises: James A. Farrell, John D. Ryan, P. A. S. Franklin, E. A. S. Clarke and E. P. Thomas.

Chicago and the South American Opportunity

CHICAGO, ILL., August 12, 1914.—First enthusiasms ordinarily go out in the direction suggested by the obvious. South America has been buying materials from Europe at the rate of $961,000,000 annually. Europe is at war and its commercial relations are at a standstill for an indefinite period. South America must buy elsewhere. Why not from the United States? Chicago men interested in the development of our foreign commerce are among the foremost in the endeavor to develop the possibilities of this situation so suddenly created. A definite campaign directed by the Foreign Commerce Bureau of the Chicago Association of Commerce is under way. A canvass is being made of local industries, information is being given to them regarding the situation in South America from the files of the association and through the direct representative of the association now resident in Buenos Aires, and in turn information is being sought regarding the desire to establish connections in South America and the character of the products for which this market is sought. It is therefore interesting to consider what we know of the South American situation. South America exports to Europe its products of agriculture and grazing to the amount of $700,000,000 each year, and its natural channels of commerce have heretofore been with Europe, where it supplies the major portion of its own needs and in which markets it is a competitor of this country. South America's shipments to us are little more than one-third of the value of its exports to Europe. This contrast represents in a general way the selection of a natural market. In addition this trade has been fostered by the unique financial position of London in matters of foreign exchange and by the colonization of South America by European peoples, particularly from Germany. South America has become almost entirely dependent upon Europe for financing. With the growth of these relations it has followed that transportation between its countries and Europe has been splendidly developed, for where cargoes are offered ships will sail. In contrast, transportation service with the United States has already been at a minimum. The largest warehousing interests of South America are controlled by the Germans and English. The banks of South America have been almost entirely branches of or connections of European banks. Under these circumstances South America has bought from us only that which it could not secure in Europe. A large part of its business is conducted on a most liberal credit basis, and from Germany in particular credit extensions have been of such length as to make the business wholly unattractive to American manufacturers. Knowing all these conditions those American interests which have been doing a considerable business in South America, prominent among them our agricultural implement manufacturers, are in many instances of the opinion that such increased sales as we might be able to make during this period when South America must find a new source of supply will be only temporary and that the time will come when much of its buying will revert to Europe.

This view may be accepted as sound except that it does not take cognizance of the new factors in the situation. Our imports from South America now exceed our exports to that country and are steadily growing. The National City Bank of New York has already taken steps for the establishment of branch banks at Buenos Aires and Rio Janeiro and plans a third at Montevideo. Furthermore, the acceptance of drawings by our banks, formerly prohibited, will now be possible under the new banking system and it will no longer be necessary to transact all our South American business by means of letters of credit on London. We shall be able to do our own accepting. The importance of the recent developments in fostering our trade can hardly be overestimated, and scarcely less important are the steps being taken in Congress paving the way for the building up of transportation service for the carrying of American goods. If there has been some racial prejudice, and if there has been some questioning of financial status, these new facilities will do much toward creating a better mutual understanding between ourselves and the South American buyers.

Yet there remain two all important problems. First, the financing of South America must be done in the United States, and just now there is a pressing need of loans which have been under negotiation with Europe and still unplaced. Second, ways must be devised for securing to South America a market for its billion of dollars of exports each year, for permanent commercial relations are dependent upon an exchange of products and South America must sell in order that it may be able to buy.

Action at Cincinnati

The Cincinnati Export Club, in which many machinery manufacturers are interested, held a meeting last week, and in conjunction with the Chamber of Commerce is formulating plans for entering Central and South American markets in all lines. Other nearby manufacturing cities, our Cincinnati correspondent writes, are working on the same plan.

South American Trade Not to Be Had Even Now Merely for the Asking

To the Editor: I have your letter of August 7, in which you ask for an expression "as to the countries in South America in which our trade can be most advantageously extended at this time, and in what iron and steel, machinery, metal working and mill supply lines rightly directed effort would bring the best results."

The questions asked are of such a broad scope that it is impossible for me to answer them in a letter and I would direct attention to the "Statistical Abstract of Foreign Countries" published by the Department of Commerce, as well as the last annual report of the Department of Commerce on the Exports of Domestic Merchandise for the years 1909-1913, as the best sources of information your readers could consult who desire to avail themselves of the present exceptional opportunity of introducing their products into South America as well as other neutral markets of the world.

NO TEMPORARY STEPS WILL AVAIL

The present deplorable situation in Europe, which of necessity will temporarily cripple European industries, affords an unusual opportunity for American manufacturers to gain a permanent foothold in the neutral markets of the world, provided their efforts directed toward this end are not merely to take a temporary advantage of the present conditions at home and abroad, but with the object of continuing the same efforts after the European industries have been completely rehabilitated from their present condition.

Our chief competitors in machinery of all kinds, as well as in iron and steel products, are English and German manufacturers. The principal South American countries imported during the last year from Great Britain $273,000,000 worth of manufactures, and $180,000,000 from Germany. France supplied $84,000,000. Of the total exports from Germany, the highest place is held by machinery, which in 1912 reached a total value of $157,500,000. The value of the German exports of other iron and steel products of various kinds was $145,000,000 and that of automobiles $16,250,000.

It is evident that the manufacturers of the belligerent countries are now unable and will be so for some little while, to supply the foreign demand for machinery and other manufactured products. To secure a portion of the trade thus made available for us, the American manufacturer must be prepared to follow the same methods of dealing with the South American purchaser as those pursued by his European rivals.

AGENCIES, LANGUAGE, CREDITS

German and English manufacturers were successful in creating so pre-eminent a position for themselves in the markets of South America and elsewhere because they maintained an efficient active and intelligent local representation, created through a long period of painstaking effort; they were also willing to extend liberal credits, which are so essential with the South American purchaser. Are the American manufacturers prepared to send down experienced salesmen, who speak the languages of the countries south of us, know their conditions and the wants of the purchasers, and are they willing to extend the customary credits? If they are prepared to meet the above conditions they will win success in the long run. Our larger manufacturers are well represented in South American countries and will doubtless take full advantage of the present opportunity, but the large number of smaller manufacturers throughout the United States desirous of doing a foreign trade must first combine for their export business, in order that they may be in a position to send to South America specially trained and capable representatives.

Manufacturers who have not heretofore made any particular effort to secure a share of the South American trade cannot expect to derive immediate benefits from the present exceptional situation. It takes time and painstaking effort to win a foreign clientele and the personal equation of the representative in the foreign field in the sale of machinery and other products as well as his knowledge of local conditions and customs are equally important factors there as at home.

FINANCIAL CONDITIONS NOT THE BEST

Such manufacturers who think they can rush into South America and obtain immediately orders for their products should consider the fact that the financial conditions in South America have been very unsatisfactory for the last year and the present European war tends to accentuate the financial embarrassment of practically all the countries of South America.

Most of the countries south of us export raw products, which are largely shipped to Europe and the market for which, due to the present situation there, will be partially closed. This will naturally diminish to an appreciable extent their purchasing power unless we are ready to absorb the products heretofore consumed in Europe and which is highly improbable.

I would still commend another factor for the careful consideration of manufacturers contemplating entering the foreign field, viz., that the South American is not prone to rapid change and those accustomed to purchasing German, English and French materials will not readily purchase American products unless they can obtain them on the same or more advantageous terms than those which they are in the habit of securing from European manufacturers.

The above brief remarks may strike your readers as a rather gloomy prospect in contrast with the expressions in our daily papers as to the wonderful opportunities that are now offered American manufacturers in South America, conveying the impression that all that is necessary for us to do is to send down representatives and their order books will be rapidly filled. Those who entertain such ideas will meet with sad disappointment. The manufacturer who is ready to go into the foreign market, not as a temporary expedient and for immediate results only, but to build up a permanent foreign trade, will find the present a most opportune time for laying a solid foundation for a future profitable foreign business.

CHARLES M. MUCHNIC,
Manager Foreign Department,
American Locomotive Company.
New York, August 10, 1914.

An Expression from Joseph G. Butler

J. G. Butler, Jr., the well known manufacturer of Youngstown, Ohio, who is officially connected with the Bessemer Limestone Company, the Brier Hill Steel Company and various other Youngstown companies, returned from Europe about a week ago. Mr. Butler while abroad met a number of leading steel manufacturers and took close observations of conditions. He sailed for home a few days before war was officially declared, but received news on the way over of the breaking out of the war, and was fortunate in sailing a week earlier than he intended. Mr. Butler expressed his views as to the probable effects of the war on the iron and steel trade of this country as follows:

"My firm belief is that the unfortunate and uncalled for war just started between European powers will be of benefit to the steel industry of the United States by reason of the fact that practically all manufacturing operations in Germany, France, Belgium and other countries will be stopped, and this should insure

very large export demand to this country for foodstuffs and iron and steel products of all kinds. A good deal of foreign trade lost to the United States by reason of the low tariffs will no doubt be recovered. England will probably continue to manufacture, and should also share in a larger export trade to South America, at least. I believe it is a splendid opportunity for the United States to push the sale of its iron and steel, machinery, electrical and other products in South America. The quality of our goods is fully as high as that of Germany, France, Belgium and other countries, and on some of our goods is much better. The only thing that in my opinion will prevent a very large increase in our foreign trade will be getting adequate transportation facilities. This condition ought to result, and no doubt will, in agitation for an American merchant marine, something this country should have had years ago.

"The United States will no doubt have a shortage in supply of foreign ores and of ferromanganese, which is necessary in the manufacture of steel. Owing to the magnitude of the war, and with the modern warfare implements that have been perfected in the last 25 years, I do not believe the war will last over 60 days, if that long. It will no doubt emphasize the fact that the United States is the money power of the world. Money is plentiful in this country and, while the banks are scrutinizing collateral very closely and in a majority of cases are refusing to loan money for speculative purposes, there are abundant funds for legitimate enterprises at fair rates of interest. This awful war is regrettable for the tremendous loss of life and property that will ensue and the suffering among the foreign people, but it cannot be otherwise than beneficial to this country."

A Time to Cooperate for Foreign Trade Extension

To the Editor: While we deplore—yes, condemn—war among civilized nations, we feel that our country is bound to excel all other nations in peaceful pursuit and never were the prospects for world supremacy in this respect better than today. We will have a chance to help rebuild the Old World if we want it. Why not get together to be able to do it right by being prepared? Let us turn the question over in our minds, how to be prepared.

Should American material, American finished products, American methods and trained Americans be made ready to swoop down at the proper time upon the now warring nations, not as eagles of war, but as doves of peace to create demand and lasting good will for things American? Or should the United States sit quietly waiting for conquered and exhausted nations to call for our products?

Our manufacturers should not miss this golden opportunity knocking at our door. It may never knock again.

And while we prepare for this new business, should we not accelerate our speed a notch or two into the Latin-American countries? Or should we wait until the Old World nations are again ready to beat us at our own door, as they have been doing in the past?

Business schools in which to train young men for the export field are the first and most important feature to consider. Not the teaching-by-mail kind, but real schools with the main object in view of teaching languages for business. Remember that anybody going out into a foreign field without the knowledge of two or three languages is deaf and dumb, and no more fit to look for business than a person afflicted by these ailments. A knowledge of language gives courage and is the backbone of every attempt to wedge into a new export field, or the old ones, for that matter, because we have not known, except in rare cases, how to handle or make use of our chances. EXPORTER.

Pan-American Union's Appeal for the South American Trade

WASHINGTON, D. C., August 11, 1914.—The iron and steel industry has a vital interest in the efforts which are being made at Washington to turn to the United States the tides of South American commerce which heretofore flowed to Europe. The outbreak of hostilities which closed the markets of Europe and paralyzed its merchant marine brought this South American field to our doors. Officials of the Department of Commerce and the representatives of the great industrial organizations of the country are clearly attempting to take advantage of this. Congressional action on a bill to increase the American merchant marine by admitting foreign built ships opens the way for handling this commerce which heretofore has been carried almost exclusively in foreign bottoms.

The Pan-American Union, the official organization of the American republics, devoted to the promotion of commerce as well as friendship among them, issued a special appeal to American industrial, commercial and financial interests to take advantage of this opportunity. It emphasizes also the fact that the crippling of Europe's commercial relations with South America threatens a crisis with our southern neighbors, ill prepared for such a check. Because of this, it declares, it would be easy to win South American commerce for the United States.

The appeal, which was prepared by Director Barrett, declares that the business interests of the United States have a duty as well as an opportunity in the critical situation that has developed in South America and that threatens suffering. It declares that the business interests of the Latin-American Republics are in peril because of the severance of their European relations. As a result it declares that the present conditions make demands upon the United States from South America which can not be neglected, but if responded to in the right spirit will be enormously beneficial to South America as well as to the United States.

MAGNITUDE OF SOUTH AMERICAN BUSINESS

Concerning the vastness of the commercial opportunities involved, the appeal says:

All South America is an enormous purchaser of the manufactured products of Europe. A large portion of this supply will be shut off during the next six months and possibly during the next year or two if the war continues. As many South American countries depend largely upon Europe for absolute necessities, and a major part of these orders are placed but a short time ahead because of the excellence of the regular shipping facilities, they are now face to face with an immediate famine in the articles which they most generally import. According to the latest available figures collated in the Pan-American Union, the ten South American countries of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela annually import products valued at $961,000,000. Of this there come from Europe products valued close to $660,000,000. While Great Britain supplies products of this total to the value of approximately $273,000,000, Germany, which is completely cut off by the war, supplies, $180,000,000; France, $84,000,000; Italy, $54,000,000; Belgium, $47,000,000; Austria-Hungary, $8,000,000; Netherlands, $8,000,000; Switzerland, $6,000,000, and other Eupropean countries lesser sums. For comparison it can be stated that the average imports from the United States of these ten countries of South America amount to approximately $155,000,000. Bearing the fact in mind that the commercial relationship of South America and Europe has been so well organized and systematized that 75 per cent. of these imports are only ordered about a month or two months ahead of their delivery, it can be realized how soon the present supplies on hand in South America will be exhausted and that she must depend upon the United States to make up the deficiency. If the United States manufacturers and exporters will exert every effort to supply this emergency demand without increase of prices, or unnecessary delay, they will accomplish great permanent good for themselves and the South American business interests alike.

The same compilation of figures shows that South America

annually exports to foreign countries products valued at approximately $1,177,000,000. Of this total nearly $700,000,000 go to Europe. Of these products Great Britain takes approximately $270,000,000; Germany, $157,000,000; France, $104,000,000; Belgium, $60,000,000; Netherlands, $44,000,000; Italy, $27,000,000; Austria-Hungary, $22,000,000; with the remaining amount divided among different countries. For comparison it can be stated that these ten countries of South America export to the United States annually products valued at approximately $250,000,000.

As nearly 90 per cent. of the exports and imports of these South American countries are carried in German, British and other European bottoms, which are now withdrawn from the sea, all of their principal ports, like Rio de Janeiro, Montevideo, Buenos Aires, Valparaiso, Callao and La Guayra are in a state equal to that of a formal blockade. The majority of these vessels will be absolutely unable to operate for many months and possibly for several years unless the situation is quickly remedied.

Passage by Congress of the bill to admit foreign ships to American registry will only partly bring relief. Director Barrett, therefore, appeals to American capital to take advantage of the opportunity thus to be presented of putting such foreign fleets under the American flag. He also appeals to the financial interests of the United States to make possible the loans needed by South American governments. It seems that many of these nations were negotiating loans in the financial capitals of Europe when the declaration of war put an end to those opportunities. As a result, it will be necessary to secure this cash from the United States. If this can be done it will go far toward making easier the increase of our commercial relations with South America.

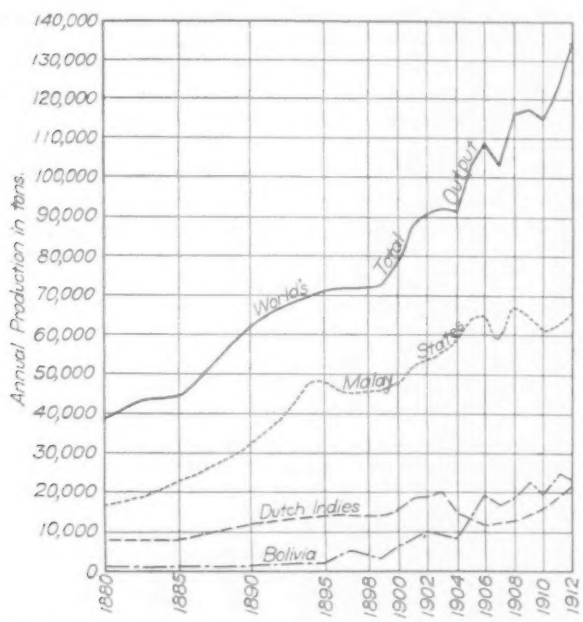
W. L. C.

Tin Prices Will Still Tend Upward

Sources of the World's Supply—Straits Settlements Output Has Limitations—Bolivia Gives Good Promise

BY EDWIN C. ECKEL

Though tin is one of the minor metals, there are certain peculiarities connected with its occurrence and utilization which render it of greater interest and importance, both financially and industrially, than a mere study of the tonnage figures would suggest. Some of the leading features of the matter are discussed briefly here.



World's Tin Production and that of Chief Producing Countries—Net Tons

Some of the peculiarities attaching to the world's tin supply come to light as soon as the geological features of the situation are examined, for we find then that the tin minerals usable as ores are few in number; that workable deposits are rare and widely scattered geographically, and that the known tin ore reserves are small as compared with those of most other metals. Next, on studying the structure of the tin industry, it is seen that it is in some stages curiously crude and unsystematic, while in other stages it offers a closer approach to monopolistic control than often occurs among the metal industries. An interesting fact of financial importance is that the smallness of the floating supply offers frequent opportunities for more or less complete corners. Finally, when the question of utilization is taken up, it is found that tin has certain very definite and valuable industrial properties, which are hard to secure in any substitute metals; and that there is room for further interesting study of the extent to which other metals have been or can be introduced as substitutes for at least a portion of the tin requirements.

TIN ORES AND ORE DEPOSITS

It has been noted that tin ores and ore deposits present certain peculiarities as compared with those of other commercial metals, being very limited in kind and type. In dealing with most other metals, there are many possible metal-bearing minerals which are to be considered as ores in various districts; and there are many types of deposits in which these ores occur. But in the case of tin the limitations in both regards are very marked.

It is true that native or metallic tin occurs in nature, being occasionally found both in hard rocks and in placer deposits, but this occurrence requires mention merely as a mineralogical curiosity. In some of the lode mines a copper-iron-tin sulphide called stannite occurs in some quantity; and this is of interest as being perhaps the source of some of the ancient bronzes. But with these trifling exceptions, all of the world's supply of tin metal is produced by the smelting of one particular tin mineral—cassiterite or tin oxide. When typically pure this ore carries close to 80 per cent. metallic tin, but usually it is associated with iron, manganese or other impurities which reduce the smelting returns materially. Owing to the weight of cassiterite, it can be concentrated quite cleanly by very crude and simple methods.

With regard to the types of deposits in which the ores occur, it may be said that the bulk of the annual output is still produced from placer workings, where the tin ore is scattered through a mass of sand, gravel and other detrital material. Most of the Australian and Asiastic tin comes from deposits of this type. The Cornwall ores now mined are from deep-level workings in hard rock, where the tin minerals occur associated with coarse silicious igneous rocks. The Bolivian output, on the other hand, though also from lode

mines, differs somewhat sharply in type of deposit, the tin ores along the Andes being associated with silver ores in deposits of more complex origin.

THE GROWTH OF THE INDUSTRY

As a commercial metal, tin has a history reaching back over six thousand years, for as early as 4500 B. C. bronzes were widely used in Egyptian ornaments and weapons. Copper and probably gold preceded tin in human use, but as yet no one has explained how a rather unusual alloy was discovered at so early a stage of man's industrial development. It is possible that the first bronzes were made from stannite, or from some other ore which happened to contain both copper and tin naturally mixed. Be that as it may, the use of tin in this form preceded that of iron by many hundreds and thousands of years, all over the ancient world.

The earliest supplies of tin were probably drawn from the eastern Mediterranean region; but Cornwall and other English areas soon became important tin mining regions. Through the Middle Ages and, indeed, until the close of the eighteenth century, Cornwall was the principal source of supply for the European world. The fairly complete statistics which are available show that the Cornish output grew slowly up to around 1000 tons per year in 1650; that there was increased tonnage as the eighteenth century came in; and that during the Revolutionary and Napoleonic wars the annual output rose to 2000 and 3000 tons.

After a temporary relapse in the early decades of the nineteenth century, the growth of the tin output was resumed, and by 1850 had reached some 5000 tons per year. The next decade, however, witnessed a remarkable gain in output along with a rapid rise in price, and this stimulated search and development of tin deposits in other parts of the world. This increased demand was undoubtedly due to the use of tin both in bronzes and as a lead-hardener, in the rearmament which took place during that decade in Europe. The Crimean, Italian and American and Prussian wars aided to keep demand active and prices high for some decades. Then, after the long business depressions following this period of war, came a new demand for tin in another form, for the canned provision trade had commenced its remarkable development which is still in progress.

The following data on prices of tin at London, quoted in pounds sterling per ton, will serve to indicate the turning points and range of prices over a long series of years:

1848	£94	1878	£66
1850	100	1882	107
1860	136	1884	84
1866	89	1891	94
1872	153		

For comparison with the recent range of prices it may be noted that since 1907 prices have ranged from 27 to 50 cents per pound. During the past ten years, in fact, an entirely new and much higher range of tin metal prices has been established, and it does not seem as if this tendency had exhausted itself.

The world's output of tin has been as follows, for a number of recent years:

Year	Tons	Year	Tons
1880	38,321	1905	103,149
1885	43,699	1910	115,920
1890	61,538	1912	134,554
1900	79,638		

MAIN SOURCES OF SUPPLY

The supply whose total importance has been summarized in the preceding paragraphs comes from relatively few sources. From 40 to 60 per cent. of the total has come, in every year since 1880, from the Federated Malay States, the old "Straits Settlements." Bolivia and the Dutch East Indies each furnish some 20 per cent. of the total. Australia and Cornwall are the remaining producers whose output enters the world markets in any important way; though the Chinese production, mostly consumed locally, is probably larger than that of either. Three of these leading producers may be described very briefly, so far as their industrial status is concerned.

Tin was first shipped from the East Indian islands of Banca and Billiton some two centuries ago, and with the fixing of Dutch control in 1822 the shipments became more steady. The real impetus to development, however, came from the rise in tin prices during the decade 1850-1860, a feature which has been previously noted. Since that time the Dutch islands have shipped steadily and on an important scale. During the past twenty years, however, the output from Banca and Billiton has shown little tendency to increase, even during periods of high tin prices; and it is perhaps fair to assume that the Dutch Indies have already passed their maximum of trade importance.

The British colonies, known until recently as the Straits Settlements, and now included in the Federated Malay States, have during the past three decades supplied from 40 to 60 per cent. of the world's tin output. In very recent years the output seems to have steadied down in a way that suggests that this source of supply has also reached its maximum productive capacity under present conditions. But here we have to deal with the possibility that the working conditions are, in large part, open to technical improvements; and it would be hazardous to assume that increased annual output can not be secured in future.

The producer which has shown the steadiest growth in annual output since 1880 has been Bolivia. All of the Bolivian tin is produced from lode mines, not from placers, so that one element of stability or growth of output is present. Furthermore, much of the Bolivian output is from mines in which silver was the leading or an important product; and the Bolivian tin output became more important to the miners as the price of silver decreased. It seems probable that deposits along the Andes of Bolivia and adjoining countries will continue to furnish an increasing percentage of the world's tin supply for a long time to come.

Of the minor sources of tin, some are old and slowly dying districts, like Cornwall and the minor European regions; others, like Australia, are areas which produce a certain tonnage but give little promise of any heavy increase in future; still others, like Alaska and numerous other localities, are new producers whose future is uncertain. But among them all there are none of any remarkable promise.

As a matter of fact, tin seems to be a really scarce metal, so far as its natural supplies are concerned—far scarcer, perhaps, than the price of the commercial metal would indicate. The original deposits of tin ores in hard rock are commonly very low in grade, and it is only the occurrence of placer deposits of tin ore which have kept down the price of tin within its past range. As these placer deposits are gradually exhausted, unless they are replaced in the trade by new and important deposits, the price of metallic tin must show a tendency toward increase. If the demands upon the supply increase as steadily in future as they have in the past, the increase in price may be very marked, for at present there are no deposits in sight which give promise of affording largely increased supplies of ore at present prices.

The Machinery Markets

Though business has been greatly upset by the stopping of exports and the feeling engender by the war that all steps involving expenditures should be taken cautiously, there is much sentiment th the causes which have interrupted trade will ultimately result in its acceleration. The great hope that new fields will be opened for export, but all forecasts can only be based at this time on opinion, i stead of facts. Uncertainty rules. In New York the quiet conditions of the past few weeks are b little changed, though some prospective business is put further into the future. New England believ that trade will eventually be stimulated by the war, though expansion of manufacturing has been large abandoned for the present. Cleveland is hopeful that South America will look to the United States f the supplies it formerly bought in Europe, while domestic conditions are not much changed, despite th cessation of exports. Cincinnati is hard hit by its halted foreign trade, working forces have been r duced and the local export organization is busy studying new markets. To date the war has not ha as disheartening effect in Milwaukee as might have been expected, and the hope there also is that th loss of European business will be made up elsewhere. In the Central South business is running on abo as usual, exports from this section being small. In St. Louis there is no depression, despite world event largely because a quickening of industrial activity is expected to come soon. Texas reports improvem in trade conditions, despite the confusion which has prevailed in the cotton market. The feature in th Pacific Northwest is a heavy demand for agricultural machinery. San Francisco shows no betterme so far as machine tools are concerned, and considerable anxiety is shown over the abrupt cessation o exports.

New York

NEW YORK, August 12, 1914.

There is but little, if any, actual change in this market, although it is seen that prospective business which it was hoped would come to an issue about this time is again put off into the future. One such instance, and an important one, is the deferring of action by the Seaboard Air Line on its long-considered list of shop equipment. The list is in the hands of the road's purchasing agent, but it is stated that because of the upset condition of its freight business, following the cessation of exports, no action will be taken until conditions become more settled. The Erie Railroad has bought a few tools for its shop at Meadville, Pa., the inquiry having been out many months. Small purchases have been made by other railroads; but the purchasing is far under normal. It is admitted by firms most of whose business is with railroads, that the railroad freight rate decision has had practically no effect in stimulating buying. This expected influence seems to have been nullified before it was ever felt because it was so thoroughly thrust into the background by the events abroad. Salesmen have had a considerable number of inquiries from general sources to investigate of late, but they complain of the difficulty in getting the inquiring parties to place orders. Most of the orders being placed are small and scattered, but they have kept up to the recent average. The great questions as to whether the foreign war will help domestic business and to what extent are constantly discussed, but cannot be answered at this time. For the immediate future the outlook is not good in view of the many manufacturers whose export business has been completely halted and who therefore can hardly be expected to buy machinery. Local foundries are running very light.

The Allied Machinery Company of America, through its representative in the Balkan States, has received a hurry-up inquiry for 50 automobile trucks and a complete briquetting machinery outfit.

John B. Wickery and associates have formed the Lansden Company, Ltd., which has purchased the rights, patents and parts of the former Lansden Company, Newark, N. J., manufacturer of electric trucks, and removed the business to Flatbush and Nostrand avenues, Brooklyn, N. Y., where it will hereafter manufacture the vehicle and conduct a general garage and repair station. It has leased the factory formerly occupied by the John R. Corbin Company, which has floor space of over 13,000 sq. ft., and direct trackage to the Long Island Railroad system.

The H. D. Best Company, 320 Fifth avenue, New York City, has been awarded the contract for the construction of an abattoir and packing plant for the Standard Provision Company of New Jersey, to be erected at the foot of Communipaw avenue, Jersey City, at an estimated cost of $174,500. It will be one story and 289 by 300 ft.

The Turner Construction Company, 11 Broadway, New York City, has been awarded the contract to erect a mechanical building and other structures at the Bayonne, N. J., plant of the Vacuum Oil Company, 61 Broadway, New York.

The Clark Flexible Coupling Company, 90 West street, New York, has established a plant in Bush Terminal Building, No. 3, Brooklyn. It has been capitalized at $50,000. C. H. Clark is president and A. H. Goddard, secretary.

Delaney & Dickson, Inc., Amsterdam, N. Y., has filed incorporation papers with a capitalization of $10,000 and w manufacture automatic inking machines. S. F. and W. Delaney and W. W. Dickson are the incorporators.

The board of water commissioners, Riverhead, N. Y., receiving bids until August 25 for construction of a wate works system for the Riverhead water district. Plans ha been prepared by Walter E. Sexton, Mineola, N. Y.

Plans for a factory building on Pearl street, Mount Ve non, N. Y., to cost $20,000, are being completed by the Be ford Mfg. Company, maker of spark plugs.

The W. & L. Mfg. Company, Buffalo, N. Y., has be incorporated by P. U. & B. C. Lee and H. Z. White with capital stock of $30,000 to manufacture automobiles an motorcycles. A plant will be equipped.

The plant of the Bison City Table Company, Buffal destroyed by fire August 2 with a loss of $30,000 on buildi and machinery, is to be rebuilt.

The American Linseed Company, Buffalo, is remodeli and enlarging its five-story plant at Ganson street, Peck Sl and the Buffalo Creek Terminal Railroad.

The equipment for the power plant at the Onondag County Tuberculosis Sanitarium, Syracuse, N. Y., will inclu boilers, engines, heating apparatus, pumps, telephone switc board, etc. The cost of the plant will be about $35,000.

The State Hospital Commission, Albany, is receiving bi for constructing a sewage pumping plant at the Rochest State Hospital, Rochester, N. Y. J. H. B. Hanify is secre tary.

The water board, Auburn, N. Y., of which J. W. Acker man is chief engineer, will receive bids until Aug. 21 for tw return tubular boilers, one of 80 hp. and one of 100 hp.

The city of Jefferson, Pa., has voted to install wate works and sewerage plants.

The town of Hurlock, Md., has voted $45,000 in bonds fo building waterworks and sewage disposal plants.

The Buffalo Forge Company, Broadway and Mortime street, Buffalo, of which William F. Wendt is president, wil soon take bids for an extensive addition to its foundry.

Joseph A. Henning, 213 North Third avenue, Mt. Vernon, N. Y., has plans completed for a glue factory, two stories an basement, which he will erect at Pelham, N. Y.

The A. W. Ott Mfg. Company, Rochester, N. Y., box mak ers, is preparing plans for a two-story and basement factory 80 x 90 ft., to be erected at Clifford and North streets.

New England

BOSTON, MASS., August 11, 1914.

Machinery manufacturers are feeling very much better than they did a week ago when the sudden closing of the European market, with the numerous orders to withhold shipments, was causing them great uneasiness. To-day the general impression among them, including those with whom European trade is a really important factor, is that while the war will be a deterrent influence in the machinery industry for a little while, the results which will follow will far more than make up for current losses of business. It is realized that a tremendous amount of manufactured goods of all descriptions that have been imported from Europe will have to be replaced by the products of American mills

and factories, and indirectly this acceleration of business will affect the machinery trade. Also, the world outside of the war territory is being scanned for new markets with a keenness and concentration without precedent in this country.

Manufacturers generally in New England expect a comprehensive revival for which the war will be largely responsible. The territory has an immense variety of industry. Certain lines will feel the benefits much more than others, because some sources of supply of raw materials are cut off. For example, some of the cotton mills will suffer from the shortage of various dye stuffs. The manufacturers of high grade carpets depend entirely upon European market for their wool. But in most cases such as these, excellent substitutes will be found before the supply on hand is wholly used up. Confidence is growing that the problem of ocean carriers will be solved in good time.

The textile machinery industry, which centers in New England, will not be affected adversely by the war, but should directly benefit from it. The United States exports little machinery of this class but imports more or less of European machinery, especially that made in England. The mill owner who wishes to increase his equipment very likely will be compelled to buy American machinery which would not be at all to his disadvantage.

As might be expected, announcements of new plants and extensions of existing works have not been numerous since the war began, owners preferring to wait a little before going ahead. In the case of one machinery builder the erection of a large pattern shop, which would probably have been undertaken this summer, will be deferred until next spring.

The Merrow Machine Company, Salem, Mass., manufacturer of hide and leather working machinery, has purchased the Gilman Andrews carriage factory in Oak street, and will occupy the premises for manufacturing. It plans to build an addition later.

The Dwight Mfg. Company, Chicopee, Mass., has awarded the contract for a mill building, the cost of which will be about $100,000.

The G. C. Bacheller Company, Bridgeport, Conn., will build a power house, of brick and steel, 47 x 48 ft., one story.

The Farist Steel Company, Bridgeport, Conn., has started work on a brick and steel power house, 55 x 78 ft., which will replace the structure recently destroyed by fire.

The Dane Machine Company, Salem, Mass., manufacturer of tanning machinery, will rebuild its shops which were destroyed in the great fire. It is proposed to erect two buildings, one 40 x 90 ft., three stories, the other 30 x 100 ft., two stories.

Means & Thacher, Inc., are building a plant at Quincy, Mass., for the manufacture of paints and specialties. The paint shop will be 30 x 72 ft., four stories, and the varnish stack 30 x 40 ft.

Albin & E. Henkel, Bridgeport, Conn., manufacturers of laces, have completed plans for a factory building, 80 x 200 ft., three stories.

The town of North Attleboro, Mass., will purchase water tube boilers within the next two weeks. William Plattner is mayor.

Chicago

CHICAGO, ILL., August 10, 1914.

The Gollos Automatic Car Heating Company, Chicago, has been incorporated with a capital stock of $75,000 to manufacture and deal in car-heating devices, automatic and otherwise. The incorporators are Anatol Gollos, 76 West Monroe street; Robert W. Reynolds and Milton M. Cohan.

The Chicago Wheel Company, Chicago, has been incorporated with a capital stock of $2500 to manufacture and deal in repairing wheels, tires and bodies for vehicles of every description. The incorporators are: E. C. Seaton, John J. Gleason and Walter Treloar. Octigan, Zahn & Anderson, 1206 Ft. Dearborn Building, are attorneys for the company.

The Gardiner Storage Battery Company, Chicago, has increased its capital stock from $12,000 to $30,000.

The Davis Automobile Accessories Company, Chicago, has been incorporated with a capital stock of $25,000 for manufacturing and dealing in auto supplies, specialties, accessories, etc. The incorporators are: E. M. Oehler, A. S. Kedzie and Harry Garrett, 3133 Indiana avenue.

The W. W. Kimball Company, manufacturer of pianos and organs, plans to erect a large new building on the present site of the building containing its offices and salesrooms at South Wabash avenue and East Jackson boulevard.

The Reilly Machine Company, Chicago, has been organized with a capital stock of $1000 by Harry Goodman, Lawrence A. Cohen, 133 West Washington street, and W. R. Swissler. It will manufacture and deal in ironing machinery, parts and supplies.

B. Karol will erect a three-story manufacturing building at the southwest corner of Kedzie avenue and Polk street at a cost of $35,000.

The Peerless Appliance Company, Chicago, has been incorporated with a capital stock of $100,000 to deal in mechanical appliances. R. W. Poelma, 3452 Hayes street, Chicago; H. F. F. Serum and T. J. Keuttler are the incorporators.

The Stevens Point foundry of the Railway Materials Company, Railway Exchange, Chicago, was slightly damaged by fire.

The Vacuum Ice Machine Company, Chicago, has been incorporated with a capital stock of $10,000 to manufacture ice machinery, etc. Louis W. Landman, 5478 Everett avenue; Lowell C. Bassford, Herbert F. Wills and Carl S. Wise are the incorporators.

The Peerless Machine Works, Freeport, Ill., has been incorporated with a capital stock of $10,000 by W. P. Sisson, Edward Funke and A. J. Funke to manufacture faucets, metal barrels, etc.

The Southern Illinois Motor & Lumber Company, Duquoin, Ill., has been incorporated with a capital stock of $25,000 by J. H. Ward, R. W. Eddleman and R. C. Eaton and will equip an automobile repair shop and also a planing mill.

The Maxwell Motor Car Company, Lawrenceville, Ill., has been incorporated with a capital stock of $200,000 by Andrew L. Maxwell, Casper L. Lewis and Noah M. Tehill.

The Parsons Casket Hardware Company, Belvidere, Ill., has been incorporated with a capital stock of $25,000 by M. C. and Paul L. Parsons and Owen Roberts to engage in the manufacture of special hardware.

The City Council, Huntingdon, Ind., has ordered the issuance of $50,000 of bonds for the repair of the lighting plant and the waterworks plant. The equipment to be purchased includes a new 2,500,000-gal. crank and fly wheel cross-compound pumping engine and condenser, with air pump, to cost $8300; two boiler feed pumps to cost $425; one feed water heater erected, $450, and one 250-kw. turbine and motor-driven condenser, to cost erected $8500; auxiliary pumps and condensers, $500; two 250-hp. boilers, one 500-hp. boiler, $7500; one generator, $1500; total for pumping and generating equipment, $35,828.

The Kise Electric Company, Peoria, Ill., will build a factory, 50 x 200 ft.

The Forest City Wire Works, Rockford, Ill., has increased its capital stock from $5000 to $25,000.

The Purity Ice & Refrigerating Company, Highland Park, Ill., has been incorporated with a capital stock of $40,000 by John A. Raabe, Edward F. Stuenkel and Charles G. Rosenow.

The Central Illinois Utilities Company, Gibson City, Ill., will place another steam turbine of 1500 hp. capacity in its main power station. Two new boilers will have to be installed for it.

The Wichita Foundry Company, Wichita, Kan., is erecting a building 40 x 42 ft.

The Illinois Oil Company, Davenport, Iowa, will build a $100,000 plant on the river front.

The Russell Grader Mfg. Company, 2209 University avenue, S. E., Minneapolis, Minn., has taken bids for an addition, 78 x 80 ft., of brick construction, one story, and for a large warehouse.

Milwaukee

MILWAUKEE, WIS., August 10, 1914.

Machine-tool builders and large machinery interests like Allis-Chalmers, Nordberg and Vilter are somewhat apprehensive as to the effect the European war will have on their foreign business, although there is much comfort in the possibility of compensating for the continental losses by an increased export business with countries not affected by the strife. The war so far has not had as much of a disheartening effect as might be expected. Local business continues to show slight improvement, but buying shows the earmarks of necessity and the volume is restricted. Throughout Wisconsin the metal trades are picking up rapidly and in many instances night forces have been added to cope with the demand. Straight machinery, however, is slow, and the bulk of the requirements is for special equipment of various kinds.

Work is being rushed by P. F. Mork, Beloit, Wis., on a fireproof addition to his foundry so that the fire of August 1 will not cause undue delay in production. The new addition is 50 x 80 ft., but will doubtless be considerably enlarged since the old buildings were partly destroyed. The generator and power plant was destroyed and the old buildings damaged.

The General Heating & Ventilating Company, Milwaukee, Wis., has been organized with $30,000 capital by C. Lachmund, who has been associated with Milwaukee metal-working plants for some years.

The Superior Water, Light & Power Company, Superior, Wis., operating the public utilities at the Wisconsin end of the Head-of-the-Lakes, has increased its capital from $1,000,000 to $1,250,000. The company is making extensive improvements and new construction. W. H. Winslow is general manager.

The Union Bag & Paper Company, Kaukauna, Wis., will make improvements to its mill to cost $5000.

The Kimberly-Clark Company, Kimberly, Wis., awarded the general contract for the construction of a brick and steel addition to its paper mill to the Immel Construction Company, Fond du Lac, Wis., at $25,000.

The Detroit Steel Products Company, Detroit, was awarded the contract for steel sash for the new $15,000 machine shop for Logemann Brothers, Thirty-second and Burleigh streets, Milwaukee.

Charles H. Burgess & Son, Beloit, Wis., have taken over the old brass foundry at Beloit and are equipping it for the production of hot air furnaces, gas water heaters and a line of stoves. The firm has been operating at Janesville, Wis., 10 miles north of Beloit, for a year and a half, but has now moved to Beloit to be near the source of its castings supply, the P. F. Mork foundry at Beloit.

The Raulf Company, Milwaukee, was awarded the general contract for the construction of a $100,000 light manufacturing building for the Franzen Investment Company at East Water and Buffalo streets, Milwaukee. Schnetzky & Son are the architects.

The Federal Machine Company, Wauwatosa, Wis., was adjudicated bankrupt on August 4 by its voluntary petition.

Articles of incorporation have been filed in behalf of the Montello & Harrisville Electric Light & Power Company, Montello, Wis. The capital stock is $40,000 and incorporators are D. W., L. M., Charles R. and Vincent McNamara and L. G. Miller.

L. F. Schoellkopf, Madison, Wis., automobile dealer and repairman, is having plans drawn for a four-story garage and shop building, 54 x 132 ft., to have an unusually large machine shop equipment. It will be of fireproof construction and the largest garage in the State capital.

An automobile shop will be established at Sauk City, Wis., by Theodore Decot, who has been operating a small garage in connection with his machine shop. It will be 44 x 86 ft., two stories, of concrete construction.

The Gurney Refrigerator Company, Fond du Lac, Wis., has closed for two weeks while general repairs are put under way. The steel department is to be rebuilt and enlarged and the boiler house remodeled.

Edward Colyer, Manitowoc, Wis., and Adolph Vahlesky, Collins, Wis., have organized the Brillion Garage Company and have purchased the business of the Calumet Auto Company, Brillion, Wis. A large repair shop will be established.

The Milwaukee county board of supervisors awarded the contract for the heating and power installation in the new power house for the $600,000 county tuberculosis sanatorium at Wauwatosa, Wis., to the Downey Heating & Supply Company, Milwaukee, at $62,315.

Official notice has been given to erectors and contractors that sealed bids for the construction of the new Milwaukee county house of correction group at Milwaukee will be received until August 20 by Louis G. Widule, county clerk. The plans by Leenhouts & Guthrie, Milwaukee, architects, estimate an expenditure of $750,000 or more. This project has been noted in *The Iron Age*, and includes three complete machine shops for convict labor.

Cleveland

CLEVELAND, OHIO, August 10, 1914.

The demand for machinery was at a low ebb before the European war broke out and there has been no noticeable change in the situation since with the exception of the holding up of foreign orders. The general feeling is that the war will not prove injurious to American manufacturing industries, but that because of the war some new foreign trade will be developed with South America and other countries that have been depending largely on Europe for their manufactured products. However, everybody is anxiously watching the situation and buyers of machinery are holding off until some definite developments appear. Only a very few sales are reported, and these were single tools.

A. M. Allen, Cleveland, engineer, has prepared plans for a $100,000 brick-making plant to be built by the Robinson Clay Products Company near Akron, Ohio.

The Lake Erie Smelting & Refining Company, Cleveland, has been incorporated with a capital stock of $50,000 by S. M. Davis, W. D. Cole, and others, to do a general refining business.

The Diamond Vial Company, Toledo, Ohio, has been formed with a capital stock of $600,000 and will establish a plant for the manufacture of glass products.

The contract has been let for a new service station to be erected in Cleveland by the Ford Motor Company, Detroit. It will be 157 x 296 ft., of reinforced concrete construction, four stories.

The Willard Storage Battery Company, Cleveland, will erect a new plant, 135 x 200 ft., on East 131st street, near St. Clair avenue.

The Gund Brewing Company, Cleveland, will erect a brick and concrete building, 98 x 133 ft., to be used as a bottling works. Louis Lohle, Chicago, is the architect.

The Maiwurm German Aluminum Company, Ashland, Ohio, has commenced the erection of an addition to its plant, 40 x 75 ft. A gas engine and some other equipment will be installed. A 110-hp. gas engine will be installed to furnish power for a 75-kw. generator, which will operate individual motors throughout the plant.

The Root-Heath Mfg. Company, Plymouth, Ohio, will enlarge its plant by the erection of two two-story additions, one 30 x 150 ft., and the other 30 x 170 ft. One will be used as a machinery room and the other as a riveting room. When the additions are completed the company will have a floor space of nearly 100,000 sq. ft.

The Ohio Galvanizing & Mfg. Company, Niles, Ohio, has placed a contract for an addition to its plant. It will be of steel and concrete construction and will provide 35,000 additional sq. ft. of floor space.

T. F. Conley, Tiffin, Ohio, will build a new boiler shop, 35 x 70 ft.

A new brass foundry will be built by the Wakefield Brass Company, Vermillion, Ohio.

It is announced that the Trumbull Public Service Company, Warren, Ohio, will make a number of power-plant improvements, including the installation of a 600-hp. steam boiler and motor-driven coal-handling apparatus.

Cincinnati

CINCINNATI, OHIO, August 10, 1914.

Local machinery manufacturers are now sharply realizing the effects on export business of the war in Europe. Cancellations continue to come in, and practically all export shipments are held up. As a consequence, it has been necessary for nearly all machine-tool builders to reduce their working forces. In a number of instances plants have been closed in order to avoid piling up any larger stocks of machines. Relief is hoped for from the railroads, but so far they have not issued any additional lists, and the present business under negotiation with them embraces only a limited number of single tools. Reports from salesmen of forging and tool steels are encouraging, but the bulk of the business they are now getting is from the automobile manufacturers.

The Printing Machinery Company, Third and Lock streets, Cincinnati, has increased its capital stock from $450,000 to $900,000, and intends to add to its manufacturing facilities at an early date.

The Foster Gear Company, 244-250 Kaiser street, Columbus, Ohio, has let the contract for a one-story brick addition to its plant.

The Columbus Die & Tool Company, Columbus, Ohio, has let the contract for a two-story machine shop to be erected at 955 Cleveland avenue. Mention of this was made some time ago.

The Consumers' Brewing Company, Columbus, Ohio, is having plans prepared for an addition to its plant that will be 52 x 52 ft., three stories, of brick construction. Power and refrigerating equipment will be required.

The Big Four Railroad system contemplates the construction of freight terminals at Dayton, Ohio, to cost approximately $200,000. Considerable structural material will be required if the project is carried out.

The American Electric Clock Company, Columbus, Ohio, has been incorporated with $100,000 capital stock by L. R. Houston, and others. Nothing has been given out as to manufacturing plans.

The Columbus Show Case Company, Columbus, Ohio, has had plans prepared for an addition to its plant that will be 50 x 75 ft., two stories, of brick construction.

Work has been commenced on the new stove foundry of the Kyle Mfg. Company, Lancaster, Ohio. It will be 100 x 400 ft., one story, of brick construction. Mention of this project was made several weeks ago.

The Midgley Tire & Rubber Company, Lancaster, Ohio, is installing machinery in its plant, and will commence operating at an early date. It is reported that additional power plant equipment will be required later on.

It is rumored that the Wood Shovel & Tool Company, Piqua, Ohio, has tentative plans under way for an addition to its plant. No details are yet available.

The Central South

LOUISVILLE, KY., August 10, 1914.

Louisville machinery manufacturers and dealers have not been affected adversely by war developments, except indirectly. Some local concerns have an export trade, but it is not sufficiently large to make its elimination for the present serious. However, new business has slowed up sharply with the opening of hostilities, as manufacturers in every line are uncertain as to the effect of the war on domestic trade, and are planning to make few improvements until the situation develops in a definite way. Some boiler builders and others are apprehensive regarding the steel plate supply, stating that they have been advised that the imports of ferro-manganese, used in steel making, will be shut off and may result in the operations of the steel mills being interrupted. An unusually large number of industrial fires in this territory may give an opening for machinery sales, while machine tools for garages seem to be in good demand.

The Kentucky Cotton Yarn Company, Louisville, is being organized with $200,000 capital stock by Ira F. Phillips and others, and will equip a plant for the manufacture of waste products, including wicking, mop yarns, automobile wiping waste, etc. The buildings are to be leased and special and power equipment will be purchased. The latter will consist of 400 hp. in motors. No generating equipment will be needed.

The Tyler Hotel, Louisville, is in the market for twin boilers to be installed in its heating plant. Nicholas Bosler, the manager, is in charge.

Henry Freuchtenicht, Louisville, will equip a grain elevator at Seventh and Mix street, and will need a 20-hp. motor, conveying equipment and other special machinery.

The Peerless Tire & Rubber Company, Louisville, recently incorporated, will require several small motors for the operation of special machinery. Address A. F. Wolkfe, 742 South Third street.

The J. Schwarzwalder Company, Louisville, has begun the erection of a steel and brick factory, to be used for the manufacture of beer kegs. Electric power will be used. Most of the wood-working machinery has been contracted for. Arthur Herb is manager.

The brass foundry of the Hillen Mfg. Company, Louisville, was slightly damaged by fire recently. Belting and transmission equipment suffered most.

The Louisville Sand & Gravel Company, which was recently incorporated with $7500 capital stock, will install digging equipment. It has not been decided whether to use steam or electric power. If the latter is decided on, two motors, 20 and 50-hp., respectively, will be purchased. M. M. Renn, of the Renn Coal Company, may be addressed.

The Chicago, Indianapolis & Louisville Railway, Transportation Building, Chicago, is reported to have plans for the equipment of a coal chute in New Albany, Ind., with motor-driven conveying machinery.

Millard Creek, Taylorsville, Ky., has completed the equipment of a machine shop for automobile repairs and an electric light plant and will be in the market for supplies from now on.

The Dixon Motor Company, Dixon, Ky., has been organized and will equip a garage and repair shop.

The Hagan Gas Engine Mfg. Company, Winchester, Ky., has been considering increasing the capacity of its plant. O. P. Evans is manager.

The Hurdle-Woods Cotton Company, Trezevant, Tenn., will build and equip a gin of large capacity. Boilers and other equipment will be needed.

The Beare Brothers Ice & Coal Company, Jackson, Tenn., which operates two ice factories, will make improvements in both. The capacity of one will be increased to 110 tons a day.

The Harris Mfg. Company, Johnson City, Tenn., will build and equip an ice factory and cold storage plant. The ice machine is to have a capacity of 30 tons a day.

The Tennessee Ice Company, Memphis, Tenn., plans to install additional equipment and increase the capacity of its plant 100 tons.

The Dixie Land, Industrial & Development Company, Knoxville, Tenn., plans to deal in machinery as well as to carry on other lines of work. E. Merle Stedman is president and general manager.

H. J. Palmer, Knoxville, Tenn., is planning the establishment of a factory for the manufacture of moving-picture screens.

The S. L. Mitchell Auto Company, Chattanooga, Tenn., which recently increased its capitalization from $10,000 to $50,000, is planning the erection of a garage and automobile repair shop.

The Dayton Veneer & Package Company, Dayton, Tenn., will install a dry-kiln, steam operated, and will also purchase a freight elevator for installation in a two-story mill building.

The plant of the Moseley Cooperage Company, Nashville, Tenn., was damaged by fire recently to the extent of $10,000. The fire originated in the boiler-room. Power and woodworking machinery will be needed for replacement. Address M. T. Moseley.

The plant of the Cumberland Tobacco Works, Nashville, Tenn., was burned last week with $50,000 loss. The fire started in the boiler-room. J. F. Regan, manager, announced that new equipment would be purchased and operations resumed.

The Citizens' Compress Company, Jackson, Tenn., which was recently organized with $100,000 capital stock, is beginning the construction of its gin building, for which power equipment will be needed.

St. Louis

ST. LOUIS, MO., August 10, 1914.

The financial situation created by the European war developments has here as elsewhere put a check on actual business in the machine-tool market. It is regarded as one of reasonably early readjustment and there is no feeling of depression but rather one of intelligent waiting until it is determined what the future is to be. The general expectation is that the result will be the early quickening of the industrial situation, with the consequent need of additional equipment. The only immediately serious feature of the situation is the status of the cotton crop soon to press toward market; but inasmuch as this does not begin to move in any volume before September and does not reach its hight until a month or more later, there is confidence that the situation will be well cleared up by that time. Dealers in mechanical equipment, therefore, are even more hopeful than they have been and not suffering from depression because of the recent crisis.

The Alta Gas Generator Company, St. Louis, has been incorporated with a capital stock of $200,000 by Michael Harris, William Sacks and Joseph A. Marre to manufacture patented mechanical gas equipment.

The St. Louis Aero Gas Machine Company, St. Louis, has been incorporated with a capital stock of $30,000 by Milton, Arthur and Herbert Kahn to engage in the manufacture of gas producing equipment.

The Uno Sanitary Container Company, St. Louis, has been incorporated with a capital stock of $16,000 by Leo H. Peltason, Alfred W. Trump and B. A. Lange and will equip to manufacture containers of various characters.

The Emerson Electric Company, St. Louis, has acquired additional space aggregating about 15,000 sq. ft. and will equip it for the increase of its electric fan manufacturing business.

The Betz Packing Company, St. Louis, will build and equip a boiler house, increasing its power plant at 3621 South Broadway. About $10,000 will be expended.

A company with a capital stock of $500,000 is being organized in St. Louis, Mo., by William A. Hutson, Kansas City, Mo., for the manufacture of aeroplanes.

The furniture manufacturing plant of William Prufrock, St. Louis, was damaged $40,000 by fire.

The W. S. Hathaway Motor Company, Kansas City, Mo., has been incorporated with a capital stock of $15,000 by W. S. Hathaway, H. C. Page and George L. Hathaway and will equip for the manufacture and repair of motors, etc.

Under a franchise formally granted, W. J. Duffield, Birch Tree, Mo., will at once equip an electric light and power plant, and also a waterworks plant.

Ewing & Childers, owners of the electric light plant at Grant City, Mo., are remodeling the plant, and are in the market for about $8000 of equipment.

The city of Kirksville, Mo., the city commissioners in charge, will expend about $25,000 on the installation of an electric light plant in connection with the pumping plant of the municipal waterworks.

An electric light and power plant to cost $6000 is to be

installed by the city of Montrose, Mo., with Mayor William J. Brownsberger in charge.

The Lawrence County Water, Light & Cold Storage Company, Aurora, Mo., of which J. R. Woodfill is manager, will double the capacity of the cold storage plant and its refrigerating equipment.

The Lakeport Land Company, 318 Long Building, Kansas City, Mo., will equip an ice factory.

The Alpine Ice Company, Kansas City, Mo., incorporated by C. M. Beachy, and others, of Wichita, Kans., will equip a raw water ice plant, installing a 50-ton Diesel engine equipment and a 5000-ton storage plant. The total cost will be $85,000. Robert M. McCandlish, Midland Building, Kansas City, is the engineer.

The Moberly Artificial Ice Company, Moberly, Mo., is having plans prepared for an ice plant of 40 tons daily capacity. The Tait-Nordmeyer Engineering Company, St. Louis, is in charge.

The Hercules Powder Company, Joplin, Mo., of which T. W. Bacchus, Wilmington, Del., is general manager, will equip a plant for the manufacture of nitric acid.

The Superior Bed Spring Company, Joplin, Mo., will equip 5000 sq. ft. of added floor space with machinery sufficient to double its output.

A hydroelectric plant, including generating equipment, etc., is planned for the Niangua River by L. C. Scott, Linn Creek, Mo., in conjunction with Chicago capitalists.

A waterworks plant for the city of Clarence, Mo., is to be installed at once, the work having been placed under the supervision of Henrici, Kent & Lowry, Kansas City, Mo., as engineers.

The city of Monett, Mo., has formally authorized the expenditure of $35,000 on a waterworks plant.

The Planters' Gin & Ice Company, Earle, Ark., has been incorporated with a capital stock of $20,000 by Daniel Boone, and others, and will equip a ginnery and an ice-making plant.

J. M. Clem & Son, Malvern, Ark., will replace their recently destroyed plant with a gin of 20 bales daily capacity and a roller corn mill, the latter including a 50-hp. motor.

The Swifton Gin Company, Swifton, Ark., has been incorporated with a capital stock of $10,000 by S. E. Spikes, A. M. Goldsmith, and others, and will install ginning equipment.

W. E. Barnes & Sons, Parkdale, Ark., will install at Wilmot, Ark., ginning equipment to cost about $10,000.

R. L. Williams, Hot Springs, Ark., will re-equip the flour and grist mill recently burned. The new plant will have 75 bbl. daily capacity.

The Atkins Electric Light & Power Company, Atkins, Ark., will install a 5-ton ice plant in conjunction with its gin and electric light equipment.

The Blytheville Construction Company, Blytheville, Ark., will double the capacity of its garage and machine shop.

The waterworks plant at Arkansas City, Ark., will be improved, about $85,000 being expended on new equipment under the direction of the Arrow Engineering Company, St. Louis.

The Arkansas Water Company, Little Rock, Ark., will increase its capacity, adding boiler and pumping equipment of 5,000,000 gal. daily; also a hydraulic crane, etc.

The German American Car Company, Sand Springs, Okla., will enlarge the capacity of its plant, tripling the equipment now installed.

The Sand Springs Mfg. Company, Sand Springs, Okla., capitalized at $75,000, will equip a plant to manufacture engines.

The Republic Oil & Pipe Line Company, Tulsa, Okla., has been incorporated with a capital stock of $100,000 by Edward C. Ryan, James Rourke, and others, and will install pumping machinery, etc.

The Ardmore Ice, Light & Power Company, Ardmore, Okla., of which H. E. Foster is secretary, will install an ice plant of 25 tons daily capacity.

George Graf, Shawnee, Okla., and associates, will equip an ice plant to cost about $10,000.

The city of Enid, Okla., will expend about $12,000 in extending the capacity of its waterworks plant.

W. M. Carter, Moorhead, Miss., and others, will equip a 6-ton gin and power plant.

The recently reported enlargement of the plant of the Hattiesburg Wood Reduction Company, Hattiesburg, Miss., will require three 150-hp. boilers, one 40-hp. engine, four pumps, eight retorts, eight tanks, condensers, etc. The equipment is being sought now.

An ice plant of undetermined capacity will be installed by A. R. Martinolich, P. O. Box 16, Handsboro, Miss.

The Southern Automobile Mfg. & Supply Company, Hibernian Bank Building, New Orleans, La., will receive bids about December 1 for equipment for the manufacture of automobiles, motor boats, gasoline engines, etc.

The Shreveport Overland Company, Shreveport, La., has been incorporated with a capital stock of $50,000 by W. H. Johnson, J. D. Youngblood and L. M. Howard and will equip a machine shop and garage.

The Hodge Fence & Lumber Company, Lake Charles, La., will equip a plant for the manufacture of combination wood and wire fencing. About $10,000 of machinery will be installed.

Texas

AUSTIN, TEXAS, August 8, 1914.

Considerable improvement in the machinery and tool trade is noted this week. Good rains have fallen over most of the State, thereby enhancing cotton crop prospects very materially. The war in Europe has so far had no noticeable effect on business and trade in Texas beyond causing temporary confusion of the cotton market.

The saw mill, boiler house, dry kiln and machine shops of William Cameron & Co., Carmona, Texas, were destroyed by fire, entailing a loss of at least $75,000. Information received from headquarters of the firm at Waco, gives positive assurance that the plant will be rebuilt.

The Farmers' Gin Company, Venus, will construct a cotton gin. W. A. Shirley is one of the principals.

The Sunshine Gin Company, Sunshine, will construct a cotton gin. A. B. Flack is among the owners.

The Farmers' Union Gin Company, Decatur, will construct a cotton gin. J. D. Taylor is one of the owners.

The Mexia Marble & Granite Works, Mexia, has moved its plant to a new location and installed new machinery, including natural gas burning equipment.

The Bryan & Central Texas Interurban Railway Company, Bryan, is preparing to construct a power station.

F. G. Baum, San Francisco, Cal., and associates, will construct a large dam across the Little Colorado River near Tolchaco, Ariz., and erect a hydroelectric plant.

The electric power plant which the Texas Power & Light Company, Austin, will construct at Paris, will be equipped with three 500-hp. latest improved Deisel engines and a full complement of electrical machinery.

The Phoenix Cotton Oil Company, Phoenix, Ariz., has broken ground for a cotton-seed oil mill which it will construct at a cost of about $75,000. J. B. Dale, Dallas, Texas, is president, and P. Latham, El Paso, manager.

The San Antonio Water Supply Company, San Antonio, will soon receive bids for the construction of an auxiliary waterworks pumping plant to cost more than $250,000. It will increase the capacity of the system from 55,000,000 gal. to 75,000,000 gal. per day.

San Francisco

SAN FRANCISCO, CAL., August 4, 1914.

No sign of revival is yet observed in the machine-tool trade. There is practically no business aside from scattered single-tool orders, and even the garage trade is hardly up to expectations. Many shops contemplate improvements to be made when business picks up, but do not consider additional investment justified under present conditions. Railroads are still holding off. Miscellaneous equipment also is quiet, though inquiries showed a slight improvement in the latter part of July. The demand for small irrigating outfits is increasing, and several large plants are being installed in northern California. Hydroelectric development is less active than for several years, but some business in this line is being placed. The situation is unsettled at the moment, as the abrupt cessation of export trade causes considerable anxiety. Several coast lumber mills are preparing to close, and the grain movement is held up; but this interruption is not expected to continue.

Plans are about ready for a machine shop in connection with the corporation yard of the city of Sacramento, Cal.

The California Portland Cement Company, Colton, Cal., is preparing to double its capacity, now 5000 bbl. per day.

The Crowley Launch & Towboat Company, San Francisco, is preparing to build a shipyard and marine railway of 200 tons capacity in Oakland. It will include machine and woodworking shops. The cost is estimated at $90,000.

The firm of Huden & Bennett, operating an iron works at Eureka, Cal., has been dissolved.

The Sperry Flour Company, Fresno, Cal., has started

work on a large grain elevator, with complete steel conveyor equipment, etc.

Plans are being prepared for a two-story concrete municipal shop building for San Francisco. Some additional equipment will probably be required.

Bids are being taken for equipment for a machine shop, forge, foundry and wood-working shop for the Union High School, Glendale, Cal.

The town of Glendora, Cal., is taking figures on a pump and power unit of about 150 hp.

The Utah Construction Company, 327 Twenty-fourth street, Ogden, Utah, is building a reinforced concrete machine shop to cost about $30,000. Considerable of its present equipment will be used in the new shop. A traveling crane is specified for the new structures. W. H. Wattis is general manager.

The Pacific Northwest

SEATTLE, WASH., August 4, 1914.

Financial conditions in Seattle are in excellent shape. Seattle bankers report that their institutions are today in the strongest position they have ever occupied, and are able to take care of any demand made upon them. The $1,000,000 recently offered the local bankers by Secretary of the Treasury McAdoo is being considered, and may be declined, as bankers report they are easily able to care for all requirements in the way of new industries. The demands from the agricultural district are heavy, due to record harvests and machinery dealers are profiting greatly from this market.

Bids for light and power bonds in the sum of $400,000 and for steam auxiliary power plant bonds in the sum of $404,000 will be received by the corporate authorities of Seattle, Wash., until noon September 5.

The report that the Noble Metals Company, 2937 Sixteenth avenue, S. W., Seattle, Wash., will build a chemical plant near Seattle to cost $1,000,000, is incorrect. The company does not plan building a plant for some time to come. The statement that G. R. Noble is president is also an error. J. A. Comer is president.

The White Pine Lumber Company, Spokane, Wash., will erect a sawmill at Westbridge, B. C.

The Fiske Rubber Company, Portland, Ore., will begin work shortly on the construction of a three-story factory at Tenth and Burnside streets.

The B. L. Bailey Lumber Company, Wheeler, Ore., will build a mill in that city at once.

The Joler Lumber Company, Eugene, Ore., has been formed by A. A. Damintio, George E. Huntly, William and M. T. Rush. It will build a sawmill at Joler station on the Willamette Pacific Railway.

The Shull Lumber Company, New Westminster, B. C., has awarded to the Sumner Iron Works, Everett, Wash., the contract for machinery for the large sawmill plant it is erecting in Westminster. The contract includes the installation of a battery of 20 Sumner upright machines.

The Frank Honey Shingle Mill, Van Wyck, Wash., was destroyed by fire recently, with a loss of more than $10,000. It is reported the plant will be rebuilt.

The Baker-May Lumber Company, Centralia, Wash., has increased its capitalization from $20,000 to $60,000. F. R. May and J. C. Dolphin are the trustees.

The city of Three Forks, Mont., has sold $45,000 worth of water bonds and will proceed at once with the installation of its proposed water system.

The Healy Boiler Company, Seattle, Wash., has been organized by F. A. Beiyon, F. J. Healy and W. R. Houghtling. It plans the erection of a plant for the manufacture of a patented water tube locomotive boiler. F. J. Healy is president.

The mill of the Atlas Lumber Company, Reliance, Wash., was recently destroyed by fire, causing a loss of approximately $100,000. All the milling machinery was destroyed. According to Charles Patten, Seattle, president of the company, it will be rebuilt.

Western Canada

WINNIPEG, MAN., August 7, 1914.

Tenders for the machinery for the new plant of the Dominion Drydock, Shipbuilding & Engineering Company, Vancouver, B. C., will be called about October 1. Theodore Frey, 14 Canadian Life Building, is financial manager of the company.

An item in *The Iron Age*, issue of July 16, stating that the shingle mill of A. Cotton, Vancouver, B. C., lumber manufacturer, was destroyed by fire is incorrect. The destruction was to the dry kilns, planing mill and stock. Reconstruction work is being carried on. W. J. Dimmick is in charge.

J. B. Brown, city clerk, Prince Albert, Sask., will receive bids until 1 p. m., August 15, for a motor-driven pump of 2500 gal. per min. capacity, with a Venturi meter.

The Dominion Sanitary Fountain Company, Medicine Hat, Alberta, is erecting a factory. A large amount of machinery will be used in the new plant.

It is announced that the Alberta Clay Products Company, Medicine Hat, Alberta, will soon make extensions to its plant.

The Conly Frog & Switch Company has commenced the construction of one of the largest manufacturing plants at Ft. William, Ont.

The Western Broom Company, Regina, Sask., will erect a factory with a capacity of 12,000 brooms per day.

The Imperial Brass Mfg. Company, Chicago, Ill., will erect a plant at Redcliffe, Alberta. It will be on the same lines as the one at Chicago and will manufacture brass, hardware specialties, pumps, valves, faucets, self-heating flatirons, etc.

The N. W. Patterson Elevator Company, Ft. William, Ont., will erect a large elevator without delay. The first unit will have a capacity of 100,000 bu.

The Dents Packing Company, of Winnipeg, Man., bought four acres of land at St. Boniface, Man., where it is erecting abattoirs and a packing plant. When completed the plant will cost between $60,000 and $70,000.

The Moose Jaw Abattoir Company will build an abattoir at Moose Jaw, Sask., to cost $60,000.

The Canadian Resources Development Company, Port Arthur, Ont., will erect a large brick plant to turn out 5000 bricks a day at the start.

The ratepayers of Richmond, B. C., passed a by-law to grant $40,000 for extensions to its waterworks system.

Eastern Canada

TORONTO, ONT., August 10, 1914.

The Swedish Crucible Steel Company, Windsor, Ont., will soon commence the construction of a gray-iron foundry. The head office of the company is at Detroit, Mich.

The National Cash Register Company, Dayton, Ohio, is erecting a plant at Toronto.

The Ideal Concrete Machinery Company, Cincinnati, Ohio, is erecting a plant at Windsor, Ont.

The Sherbrooke Machinery Company, Sherbrooke, Que., will make additions to its plant which will cost about $25,000.

It is announced that McKay Brothers, previously associated with the Nova Scotia Motor Carriage Company, Amherst and Kentville, N. S., will erect a factory at Halifax, N. S. It is said that the company will be capitalized at $100,000.

The Concrete Builders, Ltd., will erect a plant at Gibson, N. B., for the manufacture of concrete blocks and bricks.

The Regal Motor Company is building a factory at Berlin, Ont.

The Berlin Interior Hardwood Company, Berlin, Ont., will make additions to its plant.

The Briggs Planing Mill, Brockville, Ont., was destroyed by fire with a loss of $20,000.

The Montreal Lumbermen Specialties Company, Montreal, has been incorporated with a capital stock of $99,000 by Joseph P. Dupuis, and others, to manufacture and deal in lumber, timber, etc.

The Redfern Lumber Company, Montreal, has been incorporated with a capital stock of $49,000 by D. P. Gillmor, and others, to manufacture and deal in lumber, etc.

The Canadian Hard Mfg. Company, Bridgeburg, Ont., maker of beds and bedding, recently incorporated with a capital stock of $100,000, has secured a 5½-acre site on the Grand Trunk Railway and will erect a factory. The present offices of the company are with the Hard Mfg. Company, 117 Tonawanda street, Buffalo, N. Y.

The James Smart Mfg. Company, Brockville, Ont., will erect a factory building of reinforced concrete to cost $15,000 to replace the building recently destroyed by fire.

The McClary Mfg. Company, London, Ont., will build an addition to its factory, to cost $15,000.

The Forest City Glass Company, London, Ont., will build an addition to its factory. Some new equipment is required.

The A. A. Langford Company, London, Ont., will erect a factory to cost $40,000. New machinery is specified.

The Mueller Brass Works, Sarnia, Ont., is contemplating the erection of a $20,000 iron foundry.

The Patterson Mfg. Company, Montreal, will erect a factory to cost $25,000.

The Rigaud Granite Company, Montreal, will build a stone crusher plant at Rigaud, Que., at an estimated cost of $100,000. Tenders will be called for cars, electric motors and general machinery.

The Anglo-Canadian Oils, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by Robert Stein, Oscar H. King, W. J. Cheyney, and others, to refine and treat oils, etc.

The Canadian Hart Accumulator Company, London, England, will commence the construction of a factory at St. Johns, Que.

The Kenora Superheater Stove Company, Ltd., Kenora, Ont., has been incorporated with a capital stock of $50,000 by Charles Machin, John G. Bunting, James A. Kenny, and others, to manufacture superheater devices and appliances, etc.

The Stewarttown Quarries, Ltd., Milton, Ont., has been incorporated with a capital stock of $80,000 by T. R. J. Wray, James F. Coughlin, M. C. Pritchard, and others, to manufacture brick, terra cotta, stone, etc.

The Cemco, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Edward W. Wright, John A. Kent, M. C. Purvis, and others, to manufacture electrical apparatus, machinery, etc.

The International Distributing Company of Canada, Ltd., Montreal, has been incorporated with a capital stock of $10,000 by Arthur A. Tritsch, W. H. J. Tubb, and others, to manufacture safety razors, etc.

The Canadian Motion Picture Advertisers, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by W. R. Mackay, N. F. MacNeil, and others, to manufacture films, motion-picture machines, etc.

The Combusto Devices Corporation of Canada, Ltd., Montreal, has been incorporated with a capital stock of $500,000 by S. G. Dixon, William Taylor, A. M. Murray, and others, to manufacture heating machinery, etc.

The Ottawa Central Mfg. Company, Ltd., Ottawa, Ont., has been incorporated with a capital stock of $100,000 by Joseph A. Bourbeau, J. A. Desrivieres, and others, to build a lumber mill for the manufacture of doors, sashes, etc.

Benoit & Daigneault, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by J. A. Daigneault, Edmond Benoit, and others, to erect a plant for the manufacture of electric power, etc.

The Dominion Head Rest Company, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Wilfrid J. Condron, Donat Belanger, and others, of Montreal, to manufacture machinery, apparatus, etc.

Government Purchases

WASHINGTON, D. C., August 10, 1914.

The General Purchasing Officer of the Panama Canal, Washington, will receive sealed proposals until 10.30 a. m., August 17, under circular 863, for furnishing five hoists and seven motor-driven pumps. Colonel F. C. Boggs is general purchasing officer.

Bids will be opened August 18 by the Bureau of Supplies and Accounts, Navy Department, Washington, for furnishing the following: Schedule 7032, yards and docks, class 2, Mare Island—One direct-current generating unit and alternate—Same, f.o.b. works; schedule 7034, steam engineering, class 22, Puget Sound—Nine lathe chucks and alternate—Same, f.o.b. works; schedule 7144, for one wall type radial drill with tapping attachment, capacity to drill 2½-in. or to cut 4½-in. hole; one hydraulic riveting machine, depth of gap 144-in., travel of piston, 6-in.; and one multiple punch and shear, capacity to punch 20 9/16-in. holes and to shear ⅝-in. plate 48 to 60 in. in length, all for Puget Sound; schedule 7175, for one internal grinding machine to swing 15 in. and grind 11 in. deep, for Washington; schedule 7176, for one hand planer and jointer to plane 24 in. wide, 5 ft. 4 in. long, for Norfolk.

Bids were received by the general purchasing officer of the Panama Canal, Washington, August 3, schedule 862, class 1, for pumps, etc.—Bid 1, items 1 and 2 only, $6194 and $5622, 125 days; 5, items 1 and 2, $4947 and $4487, 135 days; 6, $2892 for items 14, 15 and 16, 70 days; 7, except items 14, 15 and 16, unit prices, 100 days; 8, items 1 and 2, $4480, 70 days; 10, except items 1, 2, 14, 15 and 16, $1498.40, no time; 12, items 1 to 7, $11,642, 120 days; 14, items 14, 15 and 16, $872, 70 days; 17, items 1 and 2, $6799 and $6314, 110 days; 21, items 1 and 2, $3630, and items 14, 15 and 16, $1830, no time; 26, items 8, 9, 10 and 11, $1288.91, 30 days; 37, items 6 to 13, $1612.72, 75 days; 44, item 1, $8415, $6582 and $6417; item 2, $1696, $1384 and $1364; item 3, $140; item 4, $43.50; item 5, $51.20 and $35.02; items 8, 9 and 11, $1797.63, 75 days.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, August 1, for furnishing supplies for the navy yards, as follows:

Schedule 6880, steam engineering, class 12, Mare Island—Lathe—Bid 75, units; 92, $1209.55; 106, units; 127, $1119.10, $1076.10, $1057.10, $984, $925 and $920; 130, $1096.59; 148, $1076, $1171; $931.50 and $897; 165, $1092; 205, $1345.75.

Alternate—Same, f.o.b.—Bid 75, units; 76, $924; 92, $1135.55; 106, units; 127, $1051.10, $1008.10, $989.10, $934.10, $875.10 and $870.10; 130, $1046.49; 137, $1016, $1111, $874 and $841; 205, $1254.30.

The names of the bidders and the numbers under which they are designated in the above lists are as follows:

Bid 1, Alberger Pump & Condenser Company; 5, Blackall & Baldwin Company; 6, Builders' Iron Foundry; 7, Camden Iron Works; 8, A. S. Cameron Steam Pump Works; 10, C. C. Cowpland; 12, D'Olier Centrifugal Pump & Machine Company; 14, General Electric Company; 17, Byron Jackson Iron Works; 21, Manhattan Supply Company; 26, National Transit Company; 37, Union Petroleum Company; 44, Henry Worthington; 75, Federal Sales & Service Company; 76, Garvin Machine Company; 92, Harron, Rickard & McCone; 106, Kemp Machinery Company; 127, Manning, Maxwell & Moore; 130, National Brass & Copper Tube Company; 137, D. Nast Machinery Company; 148, Pacific Tool & Supply Company; 165, Springfield Machine Tool Company; 205, Fred Ward & Son, Inc.

Trade Publications

Iron and Steel.—Ogden & Wallace, 577 Greenwich street, New York City. Two pamphlets. Contain lists of various kinds of iron and steel products that are regularly carried in stock, together with their weights. The lines covered include angles, bands, beams, channels, floor plates, galvanized hoops and sheets, half ovals and rounds, plates, sheets and steel of various shapes.

Grease Cups and Shackle Bolts.—Winkley Company, Detroit, Mich. Booklet No. 12. Describes and illustrates a line of grease cups of various kinds and gives tables of dimensions. The different bolts, which are shown, include acorn and T caps as well as two styles of ratchet bolts.

Ball Bearings in Machine Tools.—Hess-Bright Mfg. Company, Front street and Erie avenue, Philadelphia, Pa. Form No. 483-5A. Calls attention to the use of ball bearings in machine tools and shows a number of applications to machines such as hot sawing, vertical grinding, sensitive drilling, milling, plain grinding and vertical drilling machines and boring mills. The development of these bearings from the earliest type is described, followed by a brief description of the company's bearings and their uses. In connection with the illustrations of machines to which the bearings have been applied a number of drawings are presented, showing the construction.

Electrical Machinery and Carriage Feeds.—Allis-Chalmers Mfg. Company, Milwaukee, Wis. Three bulletins. The first two, Nos. 1085 and 1087, the latter superseding No. 1081, pertain to kerosene engine generating sets and polyphase induction motors, respectively. The generating set is intended for operation with an internal combustion engine, using kerosene oil as fuel and a comprehensive description of the engine and generator is given, the text being supplemented by a number of halftone engravings. A drawing showing the way in which the engine and the supply tanks are installed is presented, together with a table and diagram of dimensions. The motors described in the second bulletin are built in a number of different sizes and the general description is supplemented by engravings of several of them. The control apparatus and the various methods of connection are gone into at some length and a number of views of installations are included. The third bulletin, No. 1722, superseding No. 1702, embodies a description of the various types of carriage feed used in a sawmill. The types covered include the twin engine rope, the direct-acting steam and the friction rope styles, all of which are illustrated and briefly described.

Portable Floor Crane and Hoist.—Canton Foundry & Machine Company, Canton, Ohio. Booklet. Lists a line of portable floor cranes and hoists which are made in seven regular and nine special styles. A general description of the construction of these cranes is presented, followed by illustrations of the different sizes with tables of dimensions and a number of views of installations.

Centering Machines.—D. E. Whiton Machine Company, New London, Conn. Collection of circulars. Refers to a line of centering machines of the one and two spindle and revolving and turn table types, which are designed for mounting on benches or on bases of the pedestal or lathe variety. A separate circular is devoted to each of the different machines, a view, brief description and condensed table of specifications being presented of each.